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ABSTRACT

This Plan for Postsecondary Vocational Technical Education is a work in progress to build a seamless technical education delivery system from secondary through postsecondary education to employment. The plan outlines mechanisms to heighten citizen awareness of the critical importance of technical human resources to the state's economy. Similarly outlined are strategies for strengthening the current delivery system for postsecondary vocational technical education by enhancing program quality, increasing collaboration, and strengthening the necessary infrastructure. Chapter 1, entitled "Strengthening the Delivery System for Postsecondary Vocational Education," discusses desirable characteristics of a statewide system for postsecondary vocational education, which is essentially a vision for the future, and identifies statewide needs for strengthening this delivery system. Chapter 2, entitled "State Plan for Postsecondary Vocational Technical Education," examines the role of the: Coordinating Board for Higher Education, State Board of Education, State-Level Technical Education Council, Regional-Level Technical Education Councils, the state's community colleges, the state's vocational technical schools, Linn State Technical College, the state's baccalaureate colleges and universities, and the state's private career schools. Chapter 3, entitled "Financing of the Plan for Postsecondary Vocational Technical Education and Implementation Timeline," reports on initial financing for this state plan and provides an implementation timeline. Nine appendices are included in this report. (Contains 58 references.) (VWC)

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Prepared by the Coordinating Board for
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State Board of Education

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MISSOURI STATE PLAN FOR POSTSECONDARY TECHNICAL EDUCATION

Presented to the
Coordinating Board for Higher Education

by the

Resource Group for
Postsecondary Vocational Technical Education

Accepted
June 13, 1996

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FOREWORD

In the late 1980s and the early part of this decade, numerous studies were undertaken in Missouri that examined a variety of issues related to the state's economy and the role of education in strengthening Missouri's national and international economic competitiveness. Some of these reports were issued by the Associated Industries of Missouri (1990), Battelle Corporation in Kansas City (1990), Civic Progress in St. Louis (1990), Confluence St. Louis/Kansas City Consensus (1990), the Governor's Advisory Council on Literacy (1989), Jobs for the Future (1990), Missouri Business and Education Partnership Commission (1991), Missourians for Higher Education (1990), Missouri State Council on Vocational Education (1988), as well as the Coordinating Board for Higher Education (1988). The groups who conducted these studies were comprised of business and industry leaders throughout the state, state legislators, government officials, and educators from all levels of education. From these reports, the Coordinating Board's 1992 Task Force on Critical Choices for Higher Education recommended, and the Board adopted, a vision for higher education that would be responsive to the statewide needs identified in these reports. Among those identified needs is the necessity to "strengthen the delivery system of postsecondary vocational technical education."

The vision for higher education adopted by the Coordinating Board for Higher Education in 1992 states that:

In order to secure their collective futures, the citizens of Missouri need a postsecondary system of public and independent colleges and universities, as well as private vocational and career schools, that is distinguished by the following characteristics:

- higher education and vocational training services of the highest quality that are truly competitive on a national and international level;
- a coordinated, balanced, and cost-effective delivery system;
- a range of vocational, academic, and professional programs affordable and accessible to all citizens with the preparation and ability to benefit from the programs;
- differentiated institutional missions and implementation plans both among and within sectors designed to meet state needs and goals with a minimum of program duplication; and

- a systematic demonstration of institutional performance and accountability through appropriate assessment efforts.

Missouri's General Assembly also identified the need to strengthen Missouri's delivery system of postsecondary vocational technical education through its passage of Senate Bill 101 in 1995 (Section 178.637, RSMo) (Appendix B). In that legislation, the Coordinating Board was directed to complete:

> in cooperation with the state board of education, a comprehensive assessment of postsecondary vocational technical education in the state of Missouri. This study is to include:
>
> - an assessment of the adequacy of Missouri's delivery system for postsecondary vocational technical education and the role of area vocational schools and community colleges in meeting the needs of Missouri citizens and the employer community;
>
> - a master plan for advanced technical and vocational training that coordinates area vocational school sites with area community colleges and Linn State Technical College;
>
> - comprehensive policies for meeting the needs of Missouri citizens with the goal of obtaining a highly skilled, high demand workforce;
>
> - a means of funding advanced technical and vocational training; and
>
> - a mechanism for coordination of the delivery system between Linn State Technical College, area community colleges and area vocational schools within the service districts of the respective community colleges.

In addition, the December 1995 Governor's Conference on Higher Education, involving professionals from schools, colleges, and universities, governing board members, and business leaders, focused their discussion on issues related to workforce development and technical education. During this conference Governor Carnahan noted that "...the Department of Higher Education is committed to the kind of strategic planning which will improve the skills of our future workforce. You, the leaders of the higher education community, will help in shaping a higher education blueprint for the future. This blueprint will be an integrated system of postsecondary

education, training, and services." Governor Carnahan continued, "With the world of work changing so rapidly and people changing jobs so frequently, we must change the way we do business to meet those challenges. Developing a comprehensive, effective, and accessible technical education delivery system is crucial to ensuring that Missouri's economy continues to grow and prosper."

This State Plan for Postsecondary Vocational Technical Education provides the framework for strengthening the delivery of postsecondary vocational technical education referred to by Governor Carnahan, by responding to the legislative mandate provided in Section 178.637, RSMo (Senate Bill 101, 1995); and thus fulfills, in part, the Board's vision for and commitment to Missouri higher education.

In essence, that vision established by the Board in 1992, and this proposed plan for postsecondary vocational technical education, envisions a system of high-quality technical education and training essential for Missouri to respond to the current and future economic challenges it faces. The effectiveness of such a system requires the active participation of many sectors, including elementary and secondary education, higher education, proprietary schools, the business and industry community, labor unions, and governmental leaders. Among the challenges the state faces is to (1) strengthen the basic skills achievement of all students; (2) develop linkages among public and private schools, colleges, communities and work; (3) assess skills and other outcomes that show what students know and can do; (4) conduct regional and state-level comprehensive planning and coordinating programs, services, and financial resources; and (5) develop incentives and accountability mechanisms that promote and ensure successful efforts of the system for postsecondary vocational technical education.

The plan proposes a variety of initiatives Missouri can undertake to strengthen its system of postsecondary vocational technical education. The proposed plan suggests that the state's system of public and private higher education can work in partnership with elementary and secondary education, business and industry, labor, and government to build and support a quality workforce readiness system. Among the initiatives suggested are to:

- **strengthen existing programs and develop new programs at the associate of applied science degree level based on needs assessments;**

- **promote strong connections between educational opportunities provided by schools and colleges, and employment;**

- **implement skills assessment and encourage certification of programs;**

- **promote regional and statewide planning and coordination to provide access to quality postsecondary technical education and statewide training opportunities;**

- **provide for the establishment of regional consortia and collaborative partnerships among all associate of applied science degree program institutions and as warranted, other institutions of higher education; and**

- **develop accountability measures at the regional and state levels.**

Many people were involved in the development and shaping of this plan. The members of the Coordinating Board's Resource Group for Postsecondary Vocational Technical Education are to be commended for the time, energy, and considerable thought they contributed to the plan's development. Many local business and industry leaders attended regional meetings to discuss their concerns and issues they face in finding well-educated and highly-trained technicians for their high performance companies. In addition, on January 10, 1996, and again on May 7, 1996, the members of the Resource Group visited with members of the House and Senate Education and Appropriations Committees to discuss issues related to postsecondary vocational technical education that should be addressed in this plan. On May 17, 1996 a review of the plan was presented to both the members of the State Board of Education and the Coordinating Board for Higher Education during a joint meeting of the two boards. Finally, on June 13, 1996, the plan was accepted by the Coordinating Board for Higher Education. This plan is truly better because so many contributed to it and Missouri will be well served because of their interest and effort.

Missouri State Plan for Postsecondary Technical Education

EXECUTIVE SUMMARY

Missouri's State Plan for the delivery of postsecondary vocational technical education fulfills the vision for a strengthened system of postsecondary vocational technical education the Coordinating Board for Higher Education adopted in 1992 as part of its goals for Missouri higher education. In addition, the plan for postsecondary vocational technical education contained herein responds to the mandate given the Coordinating Board by the General Assembly in Section 178.673, RSMo (Senate Bill 101, 1995).

Senate Bill 101 directed the Coordinating Board for Higher Education to develop, in cooperation with the State Board of Education, a master plan for advanced technical education and vocational training that coordinates area vocational schools, community colleges, and Linn State Technical College in providing advanced vocational and technical training for the state of Missouri. The plan, therefore, provides the framework for building articulated courses and programs in vocational technical education to prepare the state's workforce employed in Missouri's high performance companies through a seamless transition from vocational education and Tech-Prep initiatives at the secondary level to associate of applied science and baccalaureate courses and programs for those who choose to enroll at the postsecondary level.

Identified in this plan are a variety of statewide needs for an improved and strengthened system for postsecondary vocational technical education and training that, if met, can lead Missouri to the forefront among states noted for the quality and comprehensiveness of its workforce development strategies. The identified needs reflect the comments and suggestions of business leaders who participated in small group discussions about how best to strengthen postsecondary vocational technical education and who provided insights into the kind of employees they need as well as the kind of skills needed by their employees. These discussions with employers were helpful and measurably contributed to the construction of this plan. Discussions were held in Springfield, Union, Cape Girardeau, Trenton, and St. Joseph and the employers attending came from additional communities such as Lebanon, Dexter, Sikeston, Poplar Bluff, Chillicothe, and Maryville (see Appendix C).

A report from The Department of Labor referenced in the May 10, 1996 issue of *The Chronicle of Higher Education*, identified on a national level, what many of the area business leaders said about their needs for highly skilled technicians to work in high performance companies. That article stated that manufacturers annually need 98,000 new precision manufacturing technicians. Yet each year, only 20,000 people complete formal training programs in precision manufacturing at such institutions as community colleges and technical schools. A recent NBC News report indicated that 56 per cent of manufacturers are having so much trouble finding workers of this type that they are hiring head hunters to recruit employees from abroad.

In addition, according to a national report released in March 1995 by the National Science Foundation entitled *Technical Education in 2-Year Colleges*, technicians needed in the nation's workforce must acquire useful skills and familiarity with science, mathematics, engineering, and technology and be prepared to embark immediately on careers as well as be prepared for further study. Central to the development of strategies to strengthen education for technicians and the development of these skills are changes which must be made in technical education through support of curriculum development and program improvements in science, mathematics, engineering, and technology established through collaborative efforts of academic institutions and between academe and industry. Such strategies are essential to advance major improvements in advanced technological education for science and engineering technicians and to ensure that enrollees acquire strong backgrounds in science and mathematics, and produce usable products sold at the international marketplace.

State Planning and Coordination

This state plan directs the Coordinating Board for Higher Education to utilize its statutory authority to strengthen and enhance the postsecondary vocational technical education delivery system through the inclusion of all the state's public and private schools, colleges, and universities that are part of Missouri's associate of applied science degree program delivery system.

The Coordinating Board for Higher Education will foster and promote the coordinated delivery of postsecondary vocational technical education on a regional basis. In so doing, the Board will embrace the role of the state's public community colleges as the primary providers of postsecondary vocational technical education. The Coordinating Board will also encourage other providers of associate of applied science degree programs,

both public and private, to join with the state's public community colleges in enhancing their efforts to provide statewide access to postsecondary vocational technical education to residents who do not reside within a community college district.

The State Board of Education, which is designated by state law as the State Board for Vocational Education has and should continue to have a strategic role in providing for the delivery of vocational technical education at the secondary and postsecondary level through the programs it supports at the state's comprehensive high schools, area vocational technical schools, and public two- and four-year colleges and universities. The actions of the State Board of Education, in cooperation with those of the Coordinating Board for Higher Education, will support the regional planning and delivery concepts presented in this plan.

The directors of the Departments of Economic Development, Labor and Industrial Relations, Elementary and Secondary Education, Social Services, and Higher Education, are designated as the state-level technical education council and will provide for the overall coordination of state programs related to workforce preparation and development.

Secondary and Postsecondary Connections

To begin the development of a strategy for Missouri to respond to the regional, state, and national conversations and proposed federal legislation regarding workforce preparation and development, plans to strengthen and enhance the state's postsecondary vocational technical education courses, programs, and related services will be developed on a regional level. Twelve community college service regions developed for purposes of implementing the Missouri Community College New Jobs Training Program (Sections 178.892 through 178.896, RSMo) are recommended as the geographic regions within which regional-level planning for the implementation of the state plan should occur (see Appendix G). Area vocational technical schools included within these regions are considered as part of the regional delivery system.

The purpose of the regional planning is to create collaborative, responsive, and flexible environments where educational institutions that are in close proximity will work together to systematically enhance workforce education by developing coordinated plans. The goal of the regional plans should be to:

- promote awareness of and appreciation for postsecondary vocational technical education;

- expand the accessibility of postsecondary vocational technical education within an identified region;

- encourage input and strengthen support from regional employers and labor unions for the delivery of postsecondary vocational technical education; and

- enhance and maintain a regional programmatic and instructional infrastructure for the development and enhancement of the associate of applied science degree program delivery system.

The community college president/chancellor, with the advice and recommendations of the regional technical education council, is responsible for developing and submitting a regional plan for strengthening and delivering postsecondary vocational technical education within the region to be served. In addition, the community college president, or designee, will chair the Regional-level Technical Education Council and provide the administrative support for the associate of applied science degree program-related activities contained in the regional plan for postsecondary vocational technical education that are approved by the Coordinating Board for Higher Education.

The state's 57 area vocational technical schools are pivotal points of initial access to vocational technical education at the secondary level. As a consequence, these schools, working in partnership with other institutions in regional proximity to the respective area vocational technical school and included in the state's associate of applied science degree program delivery system, can provide the structural backbone for accessing the system of postsecondary vocational technical education delivery envisioned in this plan.

Linn State Technical College (LSTC), established as a state technical college in 1995, is positioned to offer exceptional educational opportunities through highly specialized and advanced technical education and training at the certificate and associate of applied science degree levels in both emerging and specialized traditional manufacturing-related technologies not commonly offered by community colleges or area vocational technical schools. This may require targeted investments in highly specialized and

unique instructional equipment as well as differential programmatic admissions standards that are appropriate and relevant to such programs.

The state's baccalaureate institutions have an essential role in complementing the implementation of this statewide plan. Three public four-year institutions, in particular, are strategically located and have agreed upon missions and programs to assist with selected elements of this statewide plan; these are Missouri Western State College, Central Missouri State University, and Southeast Missouri State University. Two of these institutions, Central Missouri State University and Southeast Missouri State University, through their respective mission enhancement initiatives currently under discussion with the Coordinating Board for Higher Education, have an opportunity to be recognized and supported in their role in helping implement this statewide plan. Missouri Western State College is recognized and will be supported in this plan for its open enrollment admissions policy, its accredited associate and baccalaureate degree programs in vocational technical education, as well as for its ongoing relationship with Hillyard Area Vocational Technical School, area business and labor community, and with Metropolitan Community Colleges in providing access to postsecondary vocational technical education in the St. Joseph metropolitan area. In addition, the two-year branch campus of Southwest Missouri State University located in West Plains is recognized and will be supported for the postsecondary vocational technical education courses, programs, and services it offers the residents of the West Plains area.

On a statewide basis, the University of Missouri-Rolla is recognized for its continued role in advanced science and manufacturing-related engineering research, program delivery, and technology transfer. In addition the nationally recognized Department of Practical Arts and Vocational Technical Education at the University of Missouri-Columbia is recognized for its continued role in graduate education, research, development of instructional and related materials and service to the vocational technical education community.

The state's private career schools are recognized for their important role in offering the state a wide array and richly diversified system of postsecondary education. These schools offer programs preparing students and adults with job-ready skills for immediate employment. The plan recognizes the private career schools certified to operate by the Coordinating Board for Higher Education as an important state resource and capitalizes on their contribution by encouraging high performance

programs that respond quickly and effectively to emerging and changing employer needs for a highly skilled pool of prospective employees.

Summary

This Plan for Postsecondary Vocational Technical Education is a work in progress where the ultimate goal is to build a seamless technical education delivery system from secondary through postsecondary education to employment. Given the dynamic changes in Missouri's emerging economies and in technology's exploding frontiers, it will be a document that is continually crafted and reshaped to meet existing and anticipated needs. The plan is intended to empower local technical human resource developers/providers by energizing regional planning and collaboration among members of all delivery jurisdictions. The intent is to systematically enhance workforce preparation and development in the most direct way possible. A streamlined and focused structure is proposed that provides state-level decision makers with direct input. In addition, community colleges are featured as the primary catalysts for regional planning that includes a variety of deliverers and legislative and jurisdictional areas. The plan focuses on clients to be served rather than institutional aspirations and parochial self interest. This change in focus provides for new and emerging relationships among and between those Missouri institutions that are part of the state's associate of applied science degree program delivery system that has the potential to dynamically align the needs of all Missourians with new and innovative delivery possibilities.

The plan also outlines mechanisms to heighten citizen awareness of the critical importance of technical human resources to the state's economy. Similarly outlined are strategies for strengthening the current delivery system for postsecondary vocational technical education by enhancing program quality, increasing collaboration, and strengthening the necessary infrastructure.

In short, this plan presents a comprehensive approach to address the important needs of Missouri's citizens who find themselves in an increasingly competitive and technological world. Through it, the capacity of Missouri's citizens, both corporate and individual, to address technological advances and contribute to building the state's and their own economy will be enhanced.

Chapter 1

STRENGTHENING THE DELIVERY SYSTEM FOR POSTSECONDARY VOCATIONAL TECHNICAL EDUCATION

Desirable Characteristics of a Statewide System for Postsecondary Vocational Technical Education: A Vision for the Future

The development of this plan for a system of postsecondary vocational technical education has been guided by a vision of the need for a timely, responsive, and strengthened system of postsecondary vocational technical education that is of the highest quality possible. The system envisioned is one that is recognized for its excellence in the preparation of skilled technicians for the state's employer community and is distinguished by the following characteristics:

- A population that values and supports technological literacy as well as technical competence.

- An accessible, networked system of collaborating institutions of all types, employing contemporary information technology, for statewide delivery of technical education.

- An active partnership between employers, labor unions, and the state's public and private schools, colleges, and universities that identifies:
  - needed programs and services;
  - the technical competencies required of a highly trained and well-educated workforce; and,
  - shared responsibility for the success of the system.

- A governmental, private sector, and educational coalition that identifies and establishes an appropriate and relevant performance-based system of standards for comprehensive assessment and licensing.

- An infrastructure for technical education that supports:
  - related research and development;
  - pre-service and in-service teacher education;
  - data collection and analysis systems;
  - support mechanisms;

  and includes a dynamic, competency-based curriculum that
  - develops technical competence;
  - builds upon a foundation of basic and technological skills; and
  - emphasizes contextual learning.

- A coordination of resources and funding structures that focuses on the clients and constituencies served, while providing for the stability needed to permit long-term planning at the state and regional levels and responds quickly and effectively to exceptional and emerging needs.

- A comprehensive and articulated program that helps individuals be academically and technically prepared to advance to higher levels of education, employment, and income.

Identified Statewide Needs for Strengthening the Delivery System of Postsecondary Vocational Technical Education

Technical education, at all levels, has sometimes been described as having a "prestige deficit." Students, with support from their families, choose to pursue a course of study leading to the baccalaureate degree when the pursuit of an associate level degree might be the better choice. In addition, proportionately too few students choose to enroll in programs of study leading to the associate of applied science degree in a technical area when graduates of these programs are in high demand by the employer community. This is particularly true of those programs which support manufacturing, which is an industry so critical to supporting the state's economy. (See Appendix A for a list of the kind of technicians that are needed and descriptions of the skills such technicians need.)

Community colleges and private career schools, offering associate degree and certificate programs, are typically relied upon to provide vocational technical education at the postsecondary level while area vocational technical schools provide the secondary-level instruction and training as well as programs for adults. These providers of postsecondary vocational

technical education in Missouri are not, however, sufficiently dispersed around the state to provide the geographic and financial access needed for a strong and accessible system of postsecondary vocational technical education. Several Missouri communities identified as regional trade centers and/or those communities developing a substantial base of manufacturing industries do not have the kind of access to postsecondary vocational technical education and training opportunities needed for the continuing education, training, and retraining of prospective and existing employees needed by employers. (See Appendix G for a list of these communities.)

While employer and education partnerships are beginning to emerge, there is not continuous comprehensive and meaningful dialogue between educators and employers that is necessary for the state's postsecondary vocational technical education programs to meet employer needs. Too many employers identify weaknesses in the preparation of students for employment; both in basic and technical skills.

Some of these needs result from the fact that Missouri has not developed the infrastructure that is necessary to sustain a comprehensive system for the delivery, financing, and coordination of postsecondary vocational technical education. If Missouri is to develop the highly skilled workforce that is essential to the well-being of all citizens, an infrastructure to support this development must be built, including:

- establishing new postsecondary vocational technical education programs at the associate of applied science level;

- increasing the number of instructors and faculty members who can teach in the technical fields;

- renovating instructional and training facilities to accommodate the new state-of-the-art equipment that is needed for educating and training people;

- designing new funding mechanisms to finance, at the state and local level, consortia of collaborating public and private schools, colleges, and universities, that provide the education and training needed across the state;

- promoting accountability through the implementation of and compliance to performance or competency-based standards and

statewide benchmarks for industry-related technical degree programs; and

- recognizing and encouraging collaborating relationships that employ contemporary information technology in the statewide delivery of postsecondary vocational technical education.

The following strategies are suggested if these needs are to be met.

Promoting Awareness of, and Appreciation for, Technical Education

America's system of higher education has long been recognized internationally for its excellence in research and educational programs at the baccalaureate and higher degree levels. Indeed, the system of elementary and secondary education in the United States is recognized for its excellence in the preparation and education of baccalaureate degree-bound students. Countries around the world, however, are developing highly skilled workforces with high degrees of technical competence beyond the secondary level to enable them to compete more favorably in the international market place. To continue its competitive edge, a coordinated and integrated system which prepares highly skilled technicians to work in high performance companies needs to be developed. One place to begin is to enhance the prestige and value placed on technical education by Missouri's citizens, especially the youth and their families. To accomplish this will require a series of coordinated and articulated strategies directed to promoting awareness of and an appreciation for technical education beyond the secondary level. This can be accomplished through:

- Educators working with parent and school partnership programs, counseling with parents about the importance of a comprehensive education for their children whether they plan to pursue work and/or a baccalaureate, post baccalaureate degree, an associate of applied science degree or certification as a highly trained technician.

- Employers inviting grade school children, their teachers, and their parents on field trips to visit their operations and introduce them to the kind of work technicians perform and the kind of skills technicians need. Also, employers need to formally, as well as informally, demonstrate for instructors as well as students how academic subject material is used in the context of their operations.

- Elementary, middle school, and high school counselors informing and promoting with students and parents the opportunities in each career cluster or pathway available through postsecondary vocational technical education, related work opportunities, and potential earnings in highly skilled technical fields.

- Employers providing local and state sponsored, and jointly funded in-school and summer, paid and unpaid externships, internships, and apprenticeships for secondary and postsecondary vocational technical education students. Such experiences will provide a context for the academic subject material students are learning as well as develop their technological competency. These experiences will also further expose students to the kind of work technicians perform and the kind of skills technicians need.

- Developing a statewide scholarship to help finance the education and training costs of those students enrolling in postsecondary vocational technical education programs in the state's private career schools, community colleges, and associate degree-level technical education programs at the state's baccalaureate degree-level institutions.

Expanding the Accessibility of Technical Education Statewide and Strengthening Intra-regional and Inter-regional Partnerships for the Delivery of Technical Education

Missouri has 12 local community college districts and 57 area vocational schools, all offering some form of secondary and postsecondary vocational technical education. The number of industry-related technical education programs offered by the state's public and private colleges and universities are limited, concentrated mostly at Missouri Western State College, Central Missouri State University, and Southeast Missouri State University. Several private career schools offer programs in industrial-related education and training; however, these are concentrated in St. Louis and Kansas City. Many Missouri communities only have limited, if any, local or regional access to postsecondary vocational technical education, training, and retraining opportunities. Consequently, expanding geographic and financial access to technical education programs, customized training and related support for Missouri's employers is critical to the delivering of postsecondary vocational technical education and training statewide. Thus, a series of interrelated strategies, that are best employed on a regional level,

are needed to expand access to postsecondary vocational and technical education. This can be accomplished through:

- Development of regional plans for consortia of collaborating public and private schools, colleges, and universities to provide the ongoing education, training, and retraining of prospective and existing employees.

- Incorporation of telecommunications-based technologies in the delivery of technical education programs, customized training, and related services to employers as may be appropriate and relevant. The delivery of postsecondary vocational technical education which utilizes telecommunications-based technologies needs to be consistent with the Coordinating Board for Higher Education plan for a telecommunications-based delivery system and approved institutional mission enhancements for the public colleges and universities.

- Delivery by Linn State Technical College (LSTC) of exceptional educational opportunities through highly specialized and advanced technical education and training at the certificate and associate of applied science degree levels in both emerging and specialized traditional manufacturing-related technologies not commonly offered by community colleges or area vocational technical schools. Such offerings may require targeted investments in highly specialized and unique instructional and training equipment as well as differential programmatic admissions standards at LSTC that are appropriate and relevant to such programs.

- Support and enhancement of the role of the campuses of the University of Missouri in providing statewide leadership in and delivery of advanced engineering and scientific technological curricula at the master's and doctoral degree level. The University of Missouri-Rolla (UMR) has a major responsibility for meeting Missouri's needs for engineering education and research. UMR assists in the economic development of the state with the transfer of technology developments through its research. UMR's graduate programs provide faculty for the state's associate of applied science degree program delivery system. The role of the University of Missouri-Rolla in research and engineering-related technology transfer needs to be enhanced, as does the role of the Center for Technology and Small Business Development at Central Missouri State University in assisting Missouri's manufacturers in small business development.

- Investments by the state of Missouri to establish centers of technological excellence to focus on the development and delivery of advanced technological education and training. Such centers of technological excellence would be recognized by the state of Missouri as being the principal locations for the concentration of expertise and the targeting of financial and other resources in support of specific areas of excellence. Examples of such centers might include a focus on:

  integrated manufacturing;
  manufacturing and industrial technologies;
  communications-related technologies;
  micro-computer related technologies;
  biochemical and food processing technologies; and
  health-related technologies.

Encouraging Input and Strengthening Support from Business, Industry, and Labor for Technical Education

Although every school offering technical education programs has program advisory committees composed of representatives of those industries employing people from such programs, a series of discussions with business leaders conducted in association with the development of this plan suggests that there is something missing in the dialogue between employers and educators. Employers are anxious to help and want to be a part of strengthening the system of postsecondary vocational technical education and training. Clearly, Missouri employers (businesses, industries, labor organizations, educational institutions and government) have a vital role in advising students, schools, colleges and universities on the skills and competencies now required of the people they hire. This role must be encouraged and supported in a variety of ways by:

- Elementary and secondary school teachers inviting employers to their classrooms to talk with students about the importance of the personal attributes and skills children will learn in school as they relate to being valued employees. Employers need to stress as well the fact that many of the skills students will need to succeed in school are the same skills they will need at work; such as the ability to communicate, do mathematics, and apply principles of science to real world problems.

- Employers developing for students, in cooperation and consultation with the schools, secondary and postsecondary vocational technical

education externships, internships, and apprenticeships, both paid and unpaid and jointly sponsored and funded with the schools responsible for providing formal educational learning experiences.

- Places of business remaining open when not in operation, to make their facilities and equipment available for training for secondary and postsecondary vocational technical education students, instructors and faculty, and to provide customized training for residents of their communities and employees.

- Assisting curriculum developers, teachers, and faculty, in determining the skills and competencies required of students completing courses of study and degree programs leading to certificates and associate of applied science degrees. In addition, employers need to be involved in developing appropriate and relevant measures to assess those skills and competencies in the actual assessment of students.

- Employers offering job shadowing and summer internships to elementary and secondary teachers to allow them to experience the skill and competencies needed by future employees.

- Schools, colleges and universities providing employees from business and industry with the opportunity to become adjunct instructors for short periods of time in the effort to help the faculty refine and reshape the curriculum so it remains current and relevant to demands placed upon employees.

Developing and Maintaining an Infrastructure for Technical Education

A strong and vital infrastructure that supports the technical education delivery system at the state and regional level is critical to the success of expanding and strengthening technical education across the state. The expansion and strengthening of postsecondary vocational technical education in Missouri requires enhancement of the existing infrastructure for postsecondary vocational technical education. This can be accomplished through the following initiatives.

Programs

Much of the postsecondary technical education offered by the state's private career schools and community colleges support the business, health, and

service industries. The area vocational schools offer courses that support the manufacturing industry, but industry leaders are demanding higher skill levels of their prospective and existing employees than is typically available from the courses and programs offered by these schools. Too few programs, and especially programs holding professional accreditation, preparing highly skilled technicians to work in manufacturing-related industries are available in Missouri; and of those that exist, only a handful have enrollments of any size. These include programs at Jefferson College and the Florissant Valley and Forest Park campuses of the St. Louis Community College District.

To build the needed infrastructure for postsecondary vocational technical education:

- Missouri should invest in developing new programs at the associate of applied science degree level that prepare prospective employees for, and support the training and retraining of existing employees in, the technical occupations critical to Missouri employers' economic competitiveness. In developing such programs, individuals' relevant work-related experiences, diplomas, certificates, and other formal educational experiences should be recognized.

- Missouri needs to enhance selected programs so they become accredited by appropriate and relevant agencies. One hallmark of program quality is accreditation by such groups as the Accreditation Board for Engineering Technology (ABET), the National Association of Industrial Technology (NAIT), and industrial-based accreditation agencies such as the Automotive Services for Excellence (ASE) or the American Welders Society (AWS), as well as compliance with standards developed by the International Organization for Standardization. Missouri has too few of these programs.

- Representatives from area vocational schools, private career schools, community colleges, and baccalaureate degree-granting institutions need to develop appropriate and relevant program articulation agreements to enable students to plan and pursue a coordinated and articulated course of study from high school through a baccalaureate or higher degree without losing time or expending additional personal, institutional, or governmental resources.

Pre-Service and In-Service Teacher Education

There is no point in developing the new programs that are needed without the instructors and faculty to teach the postsecondary vocational technical education courses associated with such programs. Prospective teachers need to be attracted to teach postsecondary vocational technical education courses whether they come from the state's colleges and universities, from industry, or the military. In addition, many technicians can earn more by working in industry than by teaching. Developing teaching corps for postsecondary vocational technical education can be accomplished by:

- Establishing a special scholarship fund to help prospective teachers finance the cost of their education and training necessary to become instructors and faculty of postsecondary vocational technical education courses and programs.

- Developing differential salary schedules which will enable schools, colleges and universities to pay the higher salaries necessary to attract and keep highly skilled technicians as instructors and faculty members.

- Developing teacher education programs specifically designed to prepare technicians from the employer community, labor unions, or the military to become classroom and laboratory instructors for technical education courses and programs.

- Establishing programs where teachers and faculty in academic disciplines spend time working in industry to help them integrate more fully academic and technical education, and programs allowing technicians from the employer community to become adjunct instructors at the postsecondary institutions offering technical education programs.

- The Regional Professional Development Centers, located on the campuses of the state's baccalaureate degree-granting institutions, offering in-service education programs to all teachers and faculty to learn better how to integrate academic and technical education into the classroom and laboratory as well as enhance the implementation of concepts associated with contextual learning.

Facility and Equipment Update and Support

Building needed programs and developing further the corps of postsecondary vocational technical education instructors and faculty alone

will not create the kind of infrastructure that is needed. Updated and renovated facilities, mobile classrooms and laboratories, and updated state-of-the-art instructional and training equipment are needed to provide a critical foundation for the delivery of postsecondary vocational technical education. This can be accomplished by:

- Establishing a state-level capital investment fund for the improvement of existing facilities.

- Providing funds to acquire mobile instructional and training classrooms and laboratories that can be located at schools, plants and other places of business remote from existing education and training sites to complement the facilities located at fixed sites.

- Allowing schools to lease-purchase equipment rather than being required to purchase equipment that soon becomes outdated.

- Developing incentive programs for employers to donate and give state-of-the-art equipment to schools and colleges for instructional and training purposes.

Research and Data Collection

Key to the maintenance of any infrastructure is the ongoing collection, analysis and reporting of appropriate and relevant data about the enterprise. Without this, there is no way to assess the extent to which the needs of the state are being met or the system of postsecondary vocational technical education and training is expanding and becoming more accessible to Missouri residents. Consequently, a program of research, data collection, analysis, and reporting is needed and can be established by:

- Making a major investment of state funds to enhance timeliness, completeness, and responsiveness of the existing Labor Market Information System administered by the Missouri Occupational Information Coordinating Committee (MOICC) to provide the data base necessary for research and analysis related to the kind, number, and skill levels required of technicians needed regionally as well as across the state.

- Establishing a center for research to monitor and report on the changing nature of work in all industries and the skills and skill levels required by employers of the people they hire.

- Creating a uniform data collection and reporting system involving the schools, colleges, universities, and state agencies to provide the descriptive statistics necessary to inform Missourians on the size, scope, programs and services, and general qualitative and quantitative character of the state's system of postsecondary vocational technical education.

- Establishing a mechanism for schools, colleges, and universities to transcript individual's participation in formal and informal technical education and training, Adult Basic Education, and customized training as well as to transcript individual's skill levels in ways other than traditional letter grades. The electronic data interchange (EDI) technology for the collection and exchange of information should become the established mechanism for this process.

- Establishing a Missouri Institute of Technology (MIT) composed of an affiliated group of both providers of postsecondary vocational technical education and training and employers to undertake research and annually communicate on issues related to the changing nature of the role of employees and the scope of skills demanded by employers of their employees.

Funding

As with the need for research and data collection, no infrastructure for postsecondary vocational technical education can be sustained without adequate and predictable sources of funding. Because the local taxing districts that provide partial funding for the state's community colleges do not cover all areas of the state, some communities are excluded from some existing mechanisms to finance their residents access to postsecondary vocational technical education and training. In addition, the state's customized training programs have specific limitations. For example, the program available through the Department of Elementary and Secondary Education can only be administered through local education agencies. The Department of Economic Development's program is a jobs creation and development initiative which requires an increase in the number of jobs or a major capital investment by the participating company. The program available through the community college's new jobs program is limited in that training certificates may be issued only by the community college trustees. The existing funding mechanisms that help finance postsecondary vocational technical education and training can be complemented by the Governor and General Assembly supporting new legislation that would:

- Permit communities not located in an existing community college district to establish a taxing district for the purpose of raising the revenue necessary to contract for postsecondary vocational technical education and training.

- Amend existing customized training and job development legislation and related programs to enable all employers, whatever their training and retraining needs are, to have access to financial assistance in meeting their customized training and retraining needs. Such amendments should allow any provider with the appropriate and relevant instructor or faculty expertise to provide customized training, whether they are an area vocational technical school, private career school, community college, or baccalaureate degree granting institution.

- Establish a funding mechanism that encourages and finances consortia of collaborating public and private schools, colleges, and universities in providing cooperatively the education and training Missouri citizens need.

Coordination and Governance

No infrastructure for the delivery of postsecondary vocational technical education and training can be fostered without appropriate coordination and meaningful governance at the local, regional, and state levels. Currently there are many sources of funding and other resources for postsecondary vocational technical education available through a variety of uncoordinated programs administered by different federal, state, regional, and local agencies. The improved coordination and governance of postsecondary vocational technical education can be accomplished by:

- Establishing a state-level technical education council of state agency representatives from the Departments of Economic Development, Labor and Industrial Relations, Elementary and Secondary Education, Social Services, and Higher Education, to provide overall statewide coordination of research, data collection, analysis and reporting, needs assessments, programs administered, and resources made available in support of postsecondary vocational technical education.

- Establishing regional partnerships involving a consortia of collaborating public and private schools, colleges, universities and employers working cooperatively in responding to, as well as meeting

the region's needs for postsecondary vocational technical education and training.

- Creating appropriate and relevant mechanisms for the regional consortia to report on a regular basis the progress each consortium is making in meeting its regional needs for postsecondary vocational technical education. These reports should be delivered to the respective governing boards of the schools, colleges and universities, as well as employers and other regional groups and partners, such as regional planning commissions and private business and industry groups, as well as the state-level technical education council.

If these needs are met, Missouri will indeed have a system of postsecondary vocational technical education and training in all of its forms, types, and levels, which will become recognized as preparing a workforce of the highest quality possible and placing Missouri businesses and industries in a truly competitive position on a national and international level.

Chapter 2

STATE PLAN FOR POSTSECONDARY VOCATIONAL TECHNICAL EDUCATION

Numerous local, state, and federal programs and agencies provide services for the technical education and training of Missouri's citizens. These programs are administered by a multitude of state agencies and governance structures. As a result, the information is fragmented, services are duplicated or not provided, and opportunities do not reach enough of the people who need them the most. This statewide plan directs the Coordinating Board for Higher Education to utilize its statutory authority to strengthen and enhance the postsecondary vocational technical education delivery system through the inclusion of all the state's public and private schools, colleges, and universities that are part of Missouri's associate of applied science degree program delivery system.

The Coordinating Board for Higher Education will foster and promote the coordinated delivery of postsecondary vocational technical education on a regional basis. In so doing, the Board embraces the role of the state's public community colleges as the primary providers of postsecondary vocational technical education through the associate of applied science degree, both within and outside existing community college districts.

The Coordinating Board will also encourage other providers of associate of applied science degree programs, public and private, to join with the state's public community colleges in enhancing their efforts to provide access to postsecondary vocational technical education to people who do not reside within a community college district. The Board will do this on a selective basis by recognizing and supporting through a regional planning process the existing and long-standing collaborative institutional relationships developed for the purpose of delivering approved associate of applied science degree programs that exist outside community college districts. Examples of relationships the Board will recognize and support through the regional implementation of this plan include Missouri Western State College and Hillyard Area Vocational Technical School in St. Joseph, the two-year branch campus of Southwest Missouri State University located in West Plains and the community of West Plains, and the emerging relationship between Moberly Area Community College and Linn State Technical College in providing access to postsecondary vocational technical education in Mexico. Another example of the kind of collaborative relationships the Board will recognize and support through the proposed

regional planning process is the collaborative relationship that is beginning to emerge to serve Southeast Missouri which includes Three Rivers Community College, Mineral Area College, and Southeast Missouri State University

Role of the Coordinating Board for Higher Education

To implement the state plan to strengthen the state's associate of applied science degree delivery system and to enhance the delivery of postsecondary vocational technical education generally, the Coordinating Board for Higher Education, through its planning, policy development, program review and approval, data collection and analysis, role in developing budget recommendations for higher education, and responsibility for approving new sites for the delivery of higher education courses, programs, and services will:

- Be the lead agency of state government that, in consultation with a state-level technical education council composed of the directors of the Departments of Economic Development, Labor and Industrial Relations, Elementary and Secondary Education, and Social Services, has final approval of plans submitted to it describing collaborative and cooperative efforts to strengthen and enhance the state's associate of applied science degree delivery system. In addition, the CBHE will recommend that these approved plans be followed, endorsed, and supported by the state-level technical education council.

- Review and approve budget requests and recommend funding for (1) associate of applied science degree program enhancements and development, (2) expanding financial and geographic access to postsecondary vocational technical education to Missouri residents who do not reside within a current community college district and involve the collaborative delivery of services by cooperating schools, colleges, and universities, as well as (3) strengthening the state's labor market information system and research related to the changing nature of work and the kind of skills required of employees.

- Recommend funding for regional plans that increase geographic access to postsecondary vocational technical education, both within and outside existing community college districts, and increase the supply of well-educated and highly trained technicians in current and emerging highly technical fields. The communities located outside existing community college districts and targeted for initial services are the

regional trade centers and communities beginning to develop an industrial base identified in Appendix A.

In addition, the Coordinating Board for Higher Education will:

- Through its mission enhancement initiatives, provide for the state's colleges and universities with associate of applied science degree programs to develop a meaningful and appropriate role in implementing the seamless transition concepts included in this plan with respect to the articulation of associate of applied science degree courses and programs to selected baccalaureate degree programs; particularly at Central Missouri State University and Southeast Missouri State University.
- Through its mission enhancement initiatives, program review and approval responsibilities, and funding recommendations, ensure the provision of pre-service and in-service education of individuals teaching vocational technical education courses at the secondary and postsecondary levels. Through revision to its program review and approval policies system, the Board will work toward the development of policies and procedures that support educational partnerships and provide for timely responses to, and approval of, new programs and related requests.
- Encourage and support institutional efforts in achieving program accreditation by the Accreditation Board for Engineering Technology (ABET), the National Association of Industrial Technology (NAIT), and industrial based accreditation agencies such as the Automotive Service Excellence (ASE) or the American Welding Society (AWS), as well as compliance with standards developed by the International Organization for Standardization (ISO) for the relevant associate of applied science and selected baccalaureate degree programs.
- Adopt the American Association of Community Colleges 1987 Policy Statement on the associate of applied science (AAS) degree as the framework for all AAS degree programs offered by the state's public and private schools, colleges, and universities (Appendix F). Once this plan is implemented, additional options for degree nomenclature and program recognition criteria established by recognized higher education entities may be considered for inclusion within the plan's framework.
- Encourage and support the selective development of baccalaureate degree programs which are fully articulated with associate and other

baccalaureate degree programs offered by the state's community colleges and private career schools.

- Make provision for recognizing the improvement of the community colleges' vocational technical education program initiatives in its state-level Funding for Results budget recommendations for the state's community colleges; potentially focusing on improvements in student performance on measures such as the American College Testing Corporation (ACT) Work Keys and student profile and educational planning instrument, ASSET.

- Adopt the mission of Tech-Prep education as described in the federal Carl D. Perkins Vocational and Applied Technology Amendments of 1990 as being relevant and appropriate preparation at the secondary level for admission to technical associate of applied science degree programs (see Appendix E).

- Work with the state-level technical education council and the General Assembly in developing amendments to existing customized training-related legislation and related programs that will permit employer and/or contributions from foundations as well as state, and local funding, targeted to employees needing to improve and strengthen their basic and technological skills through training and retraining programs that can be offered through private career schools and baccalaureate degree-granting institutions as well as area vocational technical schools, community colleges, and Linn State Technical College to all employers.

- Work with the state-level technical education council and the General Assembly in establishing a state scholarship program for students and adults admitted to Coordinating Board for Higher Education approved associate of applied science and appropriate baccalaureate manufacturing-related education programs.

- Work with the state-level technical education council and the General Assembly in establishing a state scholarship program for students and adults preparing to teach in manufacturing-related technical education courses at the secondary and postsecondary level.

- Recommend and support legislation which would permit Missouri high school graduates to enroll in CBHE-approved associate of applied science degree programs at any Missouri institution and receive the cost of tuition, books, and fees for their first two years.

- Foster, encourage, and recognize collaborative relationships between cooperating institutions implementing innovative modes for program delivery and programs that employ contemporary information technology, including Missouri's emerging telecommunication-based delivery system, in the statewide delivery of postsecondary vocational technical education.
- Develop a data collection, analysis, and reporting system to monitor the success of the state's system of postsecondary vocational technical education in implementing this plan.
- Provide agency staff who will be the liaison between the Coordinating Board and those providing associate of applied science degree programs to ensure the successful implementation of the state plan for postsecondary vocational technical education.
- Encourage and support institutional efforts to deliver postsecondary vocational technical education and related courses via telecommunications under guidelines contained in its Plan for a Telecommunications-based Delivery System.

Role of the State Board of Education

The State Board of Education, which is designated by state law as the State Board for Vocational Education, has and should continue to have a strategic role in providing for the delivery of vocational technical education at the secondary and postsecondary level through the programs it supports at the state's comprehensive high schools, area vocational technical schools, and public two- and four-year colleges and universities. The actions of the State Board of Education, in cooperation with those actions of the Coordinating Board for Higher Education, will support the regional planning and delivery concepts presented in this plan. The State Board will assist further in the implementation of this plan by:

- Discussing with the Coordinating Board for Higher Education during the annual joint meeting of the two boards new and emerging issues related to the improvement of the state's system of postsecondary vocational technical education.
- Establishing criteria for recognizing the achievements of those high school students who have distinguished themselves by completing successfully a rigorous course of study in technical education and preparation at the secondary level.

- Ensuring, through its teacher education program approval procedures, that all newly certificated teachers at the elementary and secondary level have exposure to the role of technology and its application in the workplace.
- Examining and, if warranted, upgrading/modifying the certification criteria for secondary and postsecondary vocational and technical education teachers.
- Encouraging the state's education institutions to conduct workshops and institutes, targeted to instructors of academic and vocational technical education courses, to discuss issues related to contextual learning and to foster greater communication between all faculty members in the effort to enhance the dialogue on integrating academic and technical education at the Regional Professional Development Centers (RPDC).
- Designing, in cooperation with the Coordinating Board for Higher Education, a qualifications framework for the skill levels, patterned after the Secretary's Commission on Achieving Necessary Skills (SCANS) report and national skills standards, needed by technicians completing courses and programs of study at the secondary, postsecondary certificate, and associate of applied science degree levels.

Role of the State-level Technical Education Council

The directors of the Departments of Economic Development, Labor and Industrial Relations, Elementary and Secondary Education, Social Services, and Higher Education, are designated as the State-level Technical Education Council. The goals for this council in the delivery of postsecondary vocational technical education, that meets the needs of all Missouri citizens, are to:
promote interagency planning and cooperation;
create an environment for systemic collaboration; and
conceptualize innovations and breakthrough solutions.

Objectives for the state council in meeting these goals include:

- Assuring the approved regional plans be endorsed, followed, and supported.
- Utilizing to the fullest extent possible the resources available to their respective departments to ensure that every Missouri employer and

citizen has geographic and financial access to postsecondary vocational technical education programs, customized training and related support.

- Providing overall guidance, policy development, and new program initiatives to ensure that the needs of Missouri's citizens, businesses, and industries are being met.
- Utilizing key indicators to measure and monitor the progress the state is making in developing the state's human resources.
- Reviewing laws, rules, and regulations that may impede strengthening postsecondary vocational technical education across the state as well as limiting local access to postsecondary vocational technical education programs, services, and other opportunities and recommending needed changes, if deemed appropriate. Areas for exploration might include:ensuring that schools, colleges, and universities are able to replace technical education instructional equipment on a timely basis, including the provision for lease-purchase agreements and/or exploring the possibilities, potential and limitations of communities establishing local non-operating taxing districts similar to the neighborhood improvement districts currently authorized by Missouri statute to provide local funding of postsecondary vocational technical education programs and services brought to their community.
- Developing incentives for employers and labor unions to donate and provide state-of-the-art instructional and training equipment to schools, colleges, and universities.
- Commissioning state-level research to continually monitor the changing character of Missouri's economy, employer needs for a highly skilled workforce and the changing nature of the type and level of employment skills needed.
- Coordinating their departmental funding requests and the projects each department plans to fund ongoing as well as for new and enhanced postsecondary vocational technical education programs and related initiatives.

Role of the Regional-level Technical Education Councils

To begin the development of a strategy for Missouri to respond to the regional, state, and national conversations and proposed federal legislation regarding workforce preparation and development on a regional level, plans to strengthen and enhance the state's postsecondary vocational technical

education courses, programs, and related services should be developed on a regional level. Twelve community college service regions developed for purposes of implementing the Missouri Community College New Jobs Training Program (Sections 178.892 through 178.896, RSMo) are recommended as the geographic regions within which regional-level planning for the implementation of the state plan should occur (see Appendix G). Area vocational technical schools included within these regions are considered as part of the regional delivery system.

In 1993 these 12 regions were approved by the Coordinating Board for the purpose of supporting the state's community college's efforts to provide statewide delivery of postsecondary vocational technical education and Tech-Prep education. As may be appropriate, additional and/or other regional configurations as well as some appropriate combination of regions may emerge and provide the basis for this regional planning.

- The purpose of the regional planning is to create collaborative, responsive, and flexible environments where educational institutions that are in close proximity will work together to systematically enhance workforce education by developing coordinated plans. The goals of the regional councils should be to:

  promote awareness of and appreciation for postsecondary vocational technical education;

  expand the accessibility of postsecondary vocational technical education within an identified region;

  encourage input and strengthen support from regional employers and labor unions for the delivery of postsecondary vocational technical education; and

  enhance and maintain a regional programmatic and instructional infrastructure for the development and enhancement of the associate of applied science degree program delivery system.

- To accomplish this, planning on the regional level includes:

  an assessment and analysis of regional needs for enhancing existing and developing new associate of applied science degree programs and other related postsecondary vocational technical education courses, programs, and services;

  the identification of what and how the programs and services can best be provided collaboratively, where and by whom, (For example, collaborative partnerships can exist between the regional technical education councils and baccalaureate degree-granting institutions, located both within and outside a regional planning

and delivery area, which involve activities that are in keeping with the institutions approved mission.);
an estimate of the costs for the development of those programs and services that will be provided and a strategy for financing these initiatives, e.g., requirements for funding support from federal, state, and local resources, and the participants.

- To assist and advise the region's collaborating schools, colleges, and universities included in the state's associate of applied science degree delivery system on the development of the regional-level plans, regional technical education councils will be established and comprised of representatives of the constituencies to be served through the regional plans and the regional providers of postsecondary vocational technical education. Persons selected to participate on the regional technical education councils should be individuals who are committed to creating an environment for systemic collaboration, developing innovations, and implementing breakthrough solutions in the delivery of postsecondary vocational technical education.

- Regional employers and/or labor organizations must be represented. In addition, other representatives on the Regional Technical Education Council should come from across the service region as well as include at least one representative,as appropriate, from:
  manufacturing-related industries;
  local government;
  School-to-Work partnership(s), One-Stop-Career Center(s),and Regional Planning Commission(s), Private Industry Council(s), and vocational education advisory committee(s);
  the community college serving the identified region;
  area vocational technical school(s);
  comprehensive high schools;
  public and private baccalaureate degree-granting institution(s)within the identified region; and
  private career schools within the identified region.

- As deemed appropriate, a regional executive committee of each council may be established for a variety of purposes, including the development and writing of regional plans to be submitted to the Coordinating Board for Higher Education based upon the advice, counsel, and recommendations of the regional technical education council.

Role of the State's Community Colleges

Although the state's community college taxing districts do not cover the entire state, the community colleges and area vocational technical schools have agreed upon service areas which allow them to share responsibilities in providing statewide geographic access to their respective courses and programs. This statewide plan will assist them in helping finance and meet their objectives for providing access to their instructional and training programs throughout their designated regions. In addition:

- The community college president/chancellor, shall, appoint the members of the Regional Technical Education Council for the region they plan to serve. In addition, the community college president/chancellor, or designee, with the advice and recommendations of the regional technical education council, is responsible for developing and submitting the regional plan for strengthening and delivering of postsecondary vocational technical education within the region to be served. The community college president/chancellor, or designee, will also chair the regional-level technical education council and provide administrative support for the implementation of those activities contained in the regional plan for postsecondary vocational technical education that are approved by the Coordinating Board for Higher Education.

In addition, the state's community colleges are expected to:

- Design and recommend for approval by the Coordinating Board for Higher Education new, and/or expanded and strengthened associate of applied science degree programs in targeted areas of postsecondary vocational technical education.
- Participate, as called upon and appropriate, in offering customized employee training and retraining as made possible through amendments to existing customized training-related legislation and programs.
- Provide enrollment opportunities for those students and adults with a state scholarship for postsecondary vocational technical education in CBHE-approved manufacturing-related postsecondary programs.
- Explore opportunities to develop collaborative partnerships between institutions and communities outside the taxing district and within the service region that lead to strengthening and development of programs

that will assist in meeting the needs of the regions' employer communities.

- On a selective basis, deliver lower division general education and postsecondary vocational technical education as approved by the Coordinating Board for Higher Education and under guidelines approved by and in accordance with the CBHE Plan for a Telecommunications-based Delivery System.

Role of the State's Area Vocational Technical Schools

The state's 57 area vocational technical schools are pivotal points of initial access to vocational technical education at the secondary level. As a consequence these schools, working in partnership with other institutions in regional proximity to the respective area vocational technical school and included in the state's associate of applied science degree program delivery system, can provide the structural backbone for accessing the system of postsecondary vocational technical education delivery envisioned in this plan. Respective to this plan, the area vocational schools are expected to:

- Participate on the regional-level technical education councils and assist, as appropriate, in developing as well as being a partner in the consortium of collaborating public and private schools, colleges, and universities charged with responsibility for implementing the region's plan for postsecondary vocational technical education.
- Partner with the state's associate of applied science degree-granting institutions to develop and implement, as well as strengthen, articulation agreements for vocational technical education programs.
- Provide facilities and equipment, through a rental agreement if necessary, for the offering of postsecondary level courses and programs to provide expanded financial and geographical access for citizens within the state's community college service region.
- Partner with business and industry to provide technical training to upgrade the skills of the existing workforce.

Role of Linn State Technical College

Linn State Technical College (LSTC), established as a state technical college in 1995, is positioned to offer exceptional educational opportunities through highly specialized and advanced technical education and training at

the certificate and associate of applied science degree levels in both emerging and specialized traditional manufacturing-related technologies not commonly offered by community colleges or area vocational technical schools. This may require targeted investments in highly specialized and unique instructional equipment as well as differential programmatic admissions standards that are appropriate and relevant to such programs. It is expected that Linn State Technical College will:

- Offer highly specialized postsecondary level vocational technical education courses, certificates, and AAS programs to students pursuing programs of study on a full-time basis at the Linn State Technical College campus located in Linn, Missouri that meet manufacturing and industrial standards for programmatic outcomes and student performance.
- Collaborate with other regional providers of postsecondary and adult education in both planning for and providing access to highly specialized and advanced postsecondary vocational technical education courses, programs, and related services in Central Missouri, e.g., Mexico and Jefferson City.
- Provide enrollment opportunities for those students and adults with a state scholarship for postsecondary vocational technical education in CBHE-approved manufacturing-related postsecondary programs.
- Participate, as called upon and appropriate, in offering customized employee training and retraining as made possible through amendments to existing customized training-related legislation and programs.
- Ensure that its courses and course credits are articulated with courses and programs offered by the state's other associate of applied science and baccalaureate degree-granting institutions.
- Under guidelines approved by the Coordinating Board for Higher Education and in accordance with the CBHE plan for a telecommunications-based delivery system, as deemed appropriate and upon written request, provide highly specialized and advanced postsecondary vocational technical education via telecommunications.

Role of the State's Baccalaureate Colleges and Universities

The state's baccalaureate institutions have an essential role in complementing the implementation of this statewide plan. Three public

four-year institutions, in particular, are strategically located and have agreed upon missions and programs to assist with selected elements of this statewide plan; these are Missouri Western State College, Central Missouri State University, and Southeast Missouri State University. Two of these institutions, Central Missouri State University and Southeast Missouri State University, through their respective mission enhancement initiatives currently under discussion with the Coordinating Board for Higher Education, have an opportunity to be recognized and supported in their role in helping implement this statewide plan. Missouri Western State College is recognized and will be supported in this plan for its open enrollment admissions policy, its accredited associate and baccalaureate degree programs in vocational technical education, as well as for its ongoing relationship with Hillyard Area Vocational Technical School, area business and labor community, and with Metropolitan Community Colleges in providing access to postsecondary vocational technical education in the St. Joseph metropolitan area. In addition, the two-year branch campus of Southwest Missouri State University located in West Plains is recognized and will be supported for the postsecondary vocational technical education courses, programs, and services it offers the residents of the West Plains area.

On a statewide basis, the University of Missouri-Rolla is recognized for its continued role in advanced science and manufacturing-related engineering research, program delivery, and technology transfer. In addition, the nationally recognized (*U.S. News and World Report,* 1996) Department of Practical Arts and Vocational-Technical Education at the University of Missouri-Columbia is recognized for its continued role in graduate education, research, development of instructional and related materials, and service to the vocational technical education community.

The baccalaureate institutions, in keeping with their missions, will be encouraged to:

- Participate on the regional-level technical education councils and assist, as appropriate, in developing as well as in being a partner, in the consortium of collaborating public and private schools, colleges, and universities charged with responsibility for implementing the region's plan for postsecondary vocational technical education.
- Provide technical and logistical assistance for regional needs assessments and studies for those communities developing proposals for one-stop career centers, community telecommunication information networks, as well as, if appropriate and relevant, make their libraries,

academic support and student services areas available in support of the regional plans.

- Provide enrollment opportunities for those students and adults with a state scholarship for postsecondary vocational technical education in CBHE-approved manufacturing-related postsecondary programs.
- Participate, as called upon and appropriate, in offering customized employee training and retraining as made possible through amendments to existing customized training-related legislation and programs.
- Develop and promote education and training opportunities for Missouri's citizens, educational institutions, and the employer community through Missouri's emerging telecommunication-based delivery system.
- Partner with the state's area vocational and technical schools, community colleges, and private career schools to develop and implement, as well as strengthen, articulation agreements for vocational technical education programs.

Role of the State's Private Career Schools

The state's private career schools are recognized for the important role they have in offering the state a wide array and richly diversified system of postsecondary education. These schools offer programs preparing students and adults with job-ready skills for immediate employment. The plan recognizes the private career schools certified to operate by the Coordinating Board for Higher Education as an important state resource and capitalizes on their contribution by encouraging high performance programs that respond quickly and effectively to emerging and changing employer needs for a highly skilled pool of prospective employees. The state's private career schools offering advanced manufacturing-related technical education courses and programs will:

- Participate on the regional-level technical education councils and assist, as appropriate, in developing as well as being a partner in the consortium of collaborating public and private schools, colleges, and universities charged with responsibility for implementing the region's plan for postsecondary vocational technical education.

- Provide enrollment opportunities for those students and adults with a state scholarship for postsecondary vocational technical education in CBHE-approved manufacturing-related postsecondary programs.
- Participate, as called upon and appropriate, in offering customized employee training and retraining as made possible through amendments to existing customized training-related legislation and programs.

Chapter 3

FINANCING OF THE PLAN FOR POSTSECONDARY VOCATIONAL TECHNICAL EDUCATION AND IMPLEMENTATION TIMELINE

Initial Financing of the State Plan for Postsecondary Vocational Technical Education

Initial financing of this plan will come from the FY 1997 General Revenue Appropriation to the Coordinating Board for Higher Education for the initial implementation of this plan. The distribution of these funds will be based on the budgets included with the regional and other plans submitted to the CBHE specific to the implementation of this plan during FY 1997, i.e., July 1, 1996 to June 30, 1997. As indicated on the following timetable, the Board is expected to act on the FY 1997 plans on or about September 16, 1996. In preparation for anticipating the costs for the implementation of this plan in the future, the plans submitted to the Coordinating Board for review and approval for the FY 1997 time frame, should include anticipated ongoing and one-time costs and expected expenditures for the proposed initiatives in FY 1997, FY 1998, and FY 1999.

Given the nature of and changing technological developments and skill requirements associated with vocational technical education, it is not possible at this juncture to predict the cost of the full implementation of this plan. It is noteworthy, however, that the respondents to the survey undertaken in conjunction with the development of this plan indicated that the cost to strengthen existing and add desired new programs, would in time approximate nearly sixty million dollars ($60,000,000). It is important to note as well, that the role of the state-level technical education council, namely the Commissioner of Higher Education, the Commissioner of Education, and the respective directors of the Departments of Economic Development, Labor and Industrial Relations, and Social Services, are being directed in this plan to work cooperatively to ensure the adequate financing of postsecondary vocational technical education in Missouri that will put Missouri in the forefront of the nation in its effort to develop a well-educated and highly skilled workforce that is the envy of the world.

Implementation Timeline

To ensure a smooth and effective implementation of this plan, the following timeline will be followed by the Coordinating Board as it works with the state's system of associate of applied science degree program schools, colleges, and universities in staging the full implementation of the plan.

Phase I

June 1996

Coordinating Board for Higher Education approves state plan for postsecondary vocational technical education *(June 13)*.

July 1996

Governor and Cabinet kick off the state plan and conduct an event to increase the awareness of Missouri citizens to technical education.

FY 97 Funds become available *(July 1)*.

September 1996

Draft FY97 plans presented to the Coordinating Board for Higher Education *(September 2)*.

FY97 Labor Market Information System and Technical education research and professional development plans submitted to the Coordinating Board for Higher Education *(September 2)*.

FY97 draft plans approved by the Coordinating Board for Higher Education *(September 16)*.

October 1996

FY97 regional technical education plans implemented.

FY98 postsecondary vocational technical education budget request from the Coordinating Board for Higher Education to Missouri legislators.

December 1996

The Coordinating Board for Higher Education submits legislative proposals to the state-level technical education council for review.

January 1997

Interim regional progress reports by the regional-level technical education council submitted to the Coordinating Board for Higher Education.

State-level technical education council meets with the regional-level technical education council representatives. Criteria and progress are reviewed:

enhancing accessibility;
promoting awareness; and
strengthening partnerships.

June 1997

The Coordinating Board for Higher Education receives FY97 final reports from the regional-level technical education councils.

The Coordinating Board for Higher Education receives FY98 plans and requests from the regional-level technical education councils.

By June 30, 1997:

All Regional Technical Education Councils will be organized and operational with a two year plan of action fully developed and operational and filed with the Coordinating Board for Higher Education.

As part of the regional plan of action, the Regional Technical Education Councils will have (1) completed a regional inventory of all current technical education programs along with a quality assessment of all programs; (2) completed a survey of employers within the region assessing employer satisfaction with current technical education programs and assessing the need for new programs and developing recommendations for CBHE consideration on implementing new programs; and (3) assessed the development of the Tech Prep Associate Degree Programs within their region and designed appropriate action plans to institutionalize the structure and substance of the Tech Prep Program in the educational program.

The Regional Technical Education Councils will have established an approved plan for faculty in-service training sessions aimed at expanding the use of contextual teaching pedagogy, particularly in English, Science, Mathematics, and Social Studies; and integrating academics and vocational-technical education wherever possible.

Where applicable, the Regional Technical Education Councils will have conducted initial discussions regarding the articulation of courses and programs with faculty and administrators from comprehensive high schools, area vocational technical schools, community colleges, private career schools, and four year colleges and universities with the aim of developing written articulation agreements.

The State Technical Education Council, or State Technical Education Council designees, will have begun work on the development of a job qualifications framework.

The Regional Technical Education Council will work with employers of each region to establish school year and summer internship programs for students and teachers.

Phase II

By June 30, 1998

The State Technical Education Council will have completed the development of the job qualifications framework.

The Coordinating Board for Higher Education receives FY98 final reports from the Regional Technical Education Councils and will have completed an evaluation of the work of the Regional Technical Education Councils with appropriate recommendations for changes.

The Regional Technical Education Councils will have continued the staff development work begun in phase one.

The Regional Technical Education Councils will have implemented the recommendations for new programs or modifications of current programs coming from the surveys of phase one.

The Regional Technical Education Councils will have completed a satisfaction follow-up survey with graduates of technical education programs within the region.

The Regional Technical Education Councils will have established short-term employer internships for the majority of technical education students.

APPENDIX A

THE HISTORICAL AND EMERGING CONTEXT OF TECHNICAL EDUCATION IN MISSOURI

THE HISTORICAL AND EMERGING CONTEXT OF TECHNICAL EDUCATION IN MISSOURI

Historical Context for Postsecondary Vocational Technical Education in Missouri

In the late 1980s and the early part of this decade, numerous studies were undertaken in Missouri that examined a variety of issues related to the state's economy and the role education has in strengthening Missouri's national and international economic competitiveness. Some of these reports were issued by the Associated Industries of Missouri (1990), Battelle Corporation in Kansas City (1990), Civic Progress in St. Louis (1990), Confluence St. Louis/Kansas City Consensus (1990), the Governor's Advisory Council on Literacy (1989), Jobs for the Future (1990), Missouri Businesses and Education Partnership Commission (1991), Missourians for Higher Education (1990), Missouri State Council on Vocational Education (1988), as well as the Coordinating Board for Higher Education (1988). These reports were prepared by a number of different committees composed of representatives of business and industry, state legislators, government officials, as well as school, college, and university officials and governing board members. These studies, reports, and actions by the General Assembly, the Coordinating Board and other groups provide a historical context and framework to guide the development of the state plan for postsecondary vocational technical education.

During calendar year 1989, the Coordinating Board conducted a series of needs assessments for the north, southeast, southwest, and metropolitan regions of the state. The reports, received and approved by the Coordinating Board in February 1990 contained several recommendations adopted by the Board which are pertinent to the structure of a plan for postsecondary vocational technical education. The reports of the regional needs assessments called for improved collaboration among regional educational providers and noted that:

> There is a need, however, for those [regional] educational opportunities and services to be more effectively coordinated (articulated) in order to better meet nontraditional and continuing postsecondary educational needs. There is a need to evaluate the barriers and constraints—both geographic and programmatic—that prevent students (and prospective students) from acquiring skills and abilities in an orderly sequence which will enable them to achieve career growth and development. Attention should be devoted to questions pertaining to the ease of

transferring credits, methods of assessing student abilities and competencies, counseling of students, etc. A goal should be for educational experiences to be additive and therefore lead to more highly productive workers and citizens. Greater cooperation among the various educational providers will likely be necessary to achieve this goal.

To achieve this goal, the Board adopted the recommendation that:

> the public and independent institutions delivering for-credit postsecondary instruction establish a forum in each region, in cooperation with the Coordinating Board for Higher Education, for the purpose of discussing the delivery and coordination of needed off-campus and out-of-district courses and programs to the region's communities in a collaborative and articulated manner.

The Board also recommended that these regional collaborative groups convene at least three (3) times a year and conduct reviews of the region's educational needs with the assistance of a broadly representative committee of the public, "particularly regional businesses and industries."

In 1991 the Business and Education Partnership Commission, composed of a number of state legislators and senators, as well as business leaders, conducted a comprehensive study of Missouri's system of higher education. In the report, endorsed by the Coordinating Board for Higher Education, the commission recommended that the state's system of postsecondary vocational technical education had to be strengthened. Included with the commission's recommendations was the call for an additional $12 million investment by the state in postsecondary vocational technical education. The recommendations of the Business and Education Partnership Commission were included in Senate Bill 353 which resulted in the statewide referendum; Proposition B. The Coordinating Board for Higher Education endorsed and supported both Senate Bill 353 and Proposition B.

Following the defeat of Proposition B, the Coordinating Board established a Task Force on Critical Choices for Higher Education to develop a plan for strengthening the state's system of higher education. The Task Force, composed of the chairs of the governing boards from the public four-year colleges and universities and selected community colleges and independent institutions, presented its report to the Board in June, 1992 which the Board reviewed in October and then adopted with clarifying comments on December 10, 1992. By adopting this report the Board endorsed its vision as well as 24 goals for the state's system of higher education.

The Board has taken action to implement its vision and meet its goals for postsecondary vocational technical education through its adoption of a plan presented by the community college presidents and chancellors in 1993 for delivering technical education and tech-prep education in conjunction with the state's area vocational schools. In addition, the Board's Funding for Results budget recommendations have, in the past included funding for the number of degrees conferred in critical disciplines (Goal 14); $2,694,000 in FY 1994, $2,814,000 in FY 1995, and $1,347,500 in FY 1996. The Board's funding recommendations for Workforce Preparation ($5 million in FY 1997) are also actions the Coordinating Board for Higher Education has taken in its effort to strengthen postsecondary vocational technical education in support of workforce development.

Missouri's General Assembly has joined with the CBHE in identifying the need to strengthen Missouri's delivery system of postsecondary vocational technical education through its passage of Senate Bill 101 in 1995 (Section 178.637, RSMo). In that legislation, the Coordinating Board is directed to complete in cooperation with the State Board of Education, a comprehensive assessment of postsecondary vocational technical education in the state of Missouri and prepare a plan for the delivery of vocational technical education at the postsecondary level.

Developing the State Plan for Technical Education

As part of the Coordinating Board's strategy to develop a Blueprint for the Future of Higher Education, adopted in October 1995, the Board called for the appointment of a Resource Group for Technical Education to assist in the preparation of the plan for postsecondary vocational technical education. It was the Board's intent that this plan respond to the needs the Board identified in 1992 and the legislative mandate provided by Senate Bill 101. In December 1995, the Board approved a charge for the Technical Education Resource Group and appointed the members.

In the course of its deliberations, the Technical Education Resource Group reviewed a variety of data and other information related to the state's economy and the existing system of postsecondary vocational technical education. Of particular note is the fact that, while only 15 percent of Missouri's workforce is working in business and industries related to manufacturing, that industry contributes 34 percent toward the value added to the state's economy by converting raw materials into products sold around the world (Figure 1).

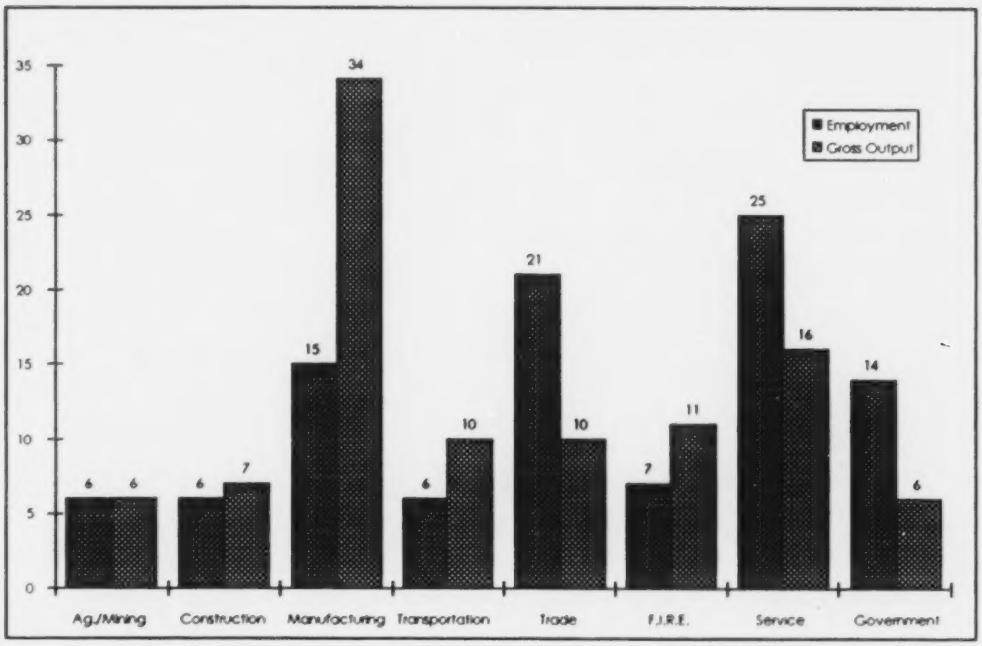

Figure 1. Missouri Employment and Gross Output by Sector, 1990.

Noteworthy as well is the fact that the Department of Economic Development, as it works to attract companies nationally and internationally to locate in Missouri, is recruiting manufacturing-related industry such as:

- Automotive Related
- Food Processors
- Electronics
- Distributors
- Telecommunications Equipment
- Plastics

The type of employees these manufacturing-related companies need are highly skilled technicians, most of whom need education and training at the postsecondary level. Business leaders indicated that they prefer the technicians hold the associate of applied science degree. Examples of technicians in demand by Missouri manufacturers are:

- Machinist
- Maintenance Employees
- Mechanics
- General Equipment Operators
- Tool and Die Makers

- Welders
- Solderers
- Screen Printers

While the manufacturing industry contributes much to the state's economy and represents the type of companies the state is recruiting, the state does not have the associate degree program completers needed to produce the number of highly skilled technicians this industry needs. As indicated by Figure 2, Missouri is preparing a large number of people at the certificate and associate degree level for the health and allied heath occupations as well as business-related, but too few in those areas that support the state's manufacturers, i.e., engineering technology, precision production, mechanics and repairers, science technology, and computer science.

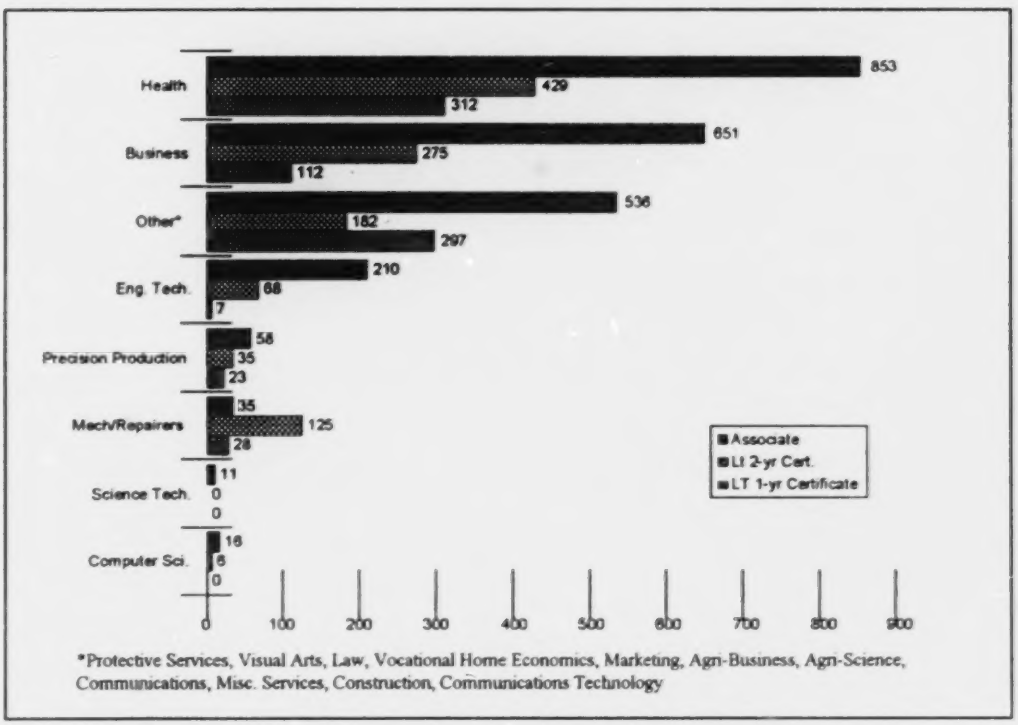

Figure 2. Certificates and Associate Degrees Conferred in Occupationally-Specific Programs, Public Two-year Institutions, FY 1994.

Much of the postsecondary vocational technical education and training being done in Missouri is through customized training programs offered through the state's area vocational technical schools and community colleges and financed in part through funding programs administered by the

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Department of Elementary and Secondary Education and the Department of Economic Development. Much of this training is to improve employees' skills in welding, hydraulics/pneumatics, electronics, robotics and machine tool technologies as well as computer training related to the manufacturing process. While customized training programs are essential components to the overall strategy to continually upgrade the skills of the state's workforce, such programs are not a replacement for strong and viable associate degree level programs offered through the state's public and private two- and four-year colleges.

The degree to which higher education is an essential partner in strengthening the state's economy through its programs of study at the postsecondary level was recognized by the Governor when he issued Executive Order 95-11 which calls for an interagency team to implement a statewide workforce development plan based upon the recommendations of the Missouri Training and Employment Council (MTEC). The Council is composed, in part, of the agency directors from the five state departments involved in providing or supporting education and job training for the citizens of the state. The five departments include the Departments of Higher Education, Elementary and Secondary Education, Economic Development, Labor and Industrial Relations, and Social Services. As noted in Executive Order 95-11, there is the clear expectation that the five agency directors will work together as an interagency team to implement a statewide workforce development plan.

The Emerging Context for Postsecondary Vocational Technical Education in Missouri

Clearly, today's economy and the world of work that supports/engenders it is significantly different than that even of just ten short years ago! The rate of change has exploded. The amount of technology readily available to all has increased exponentially. Work security has decreased considerably. Competition has escalated to global proportions. The future is much less predictable than before.

But, what do we know? We certainly know that today's and tomorrow's economy (gross domestic product) and quality of life are both far more inextricably linked to the educational level of our peoples than ever before. Unless we are highly capable, we will be unable to attract new industry to Missouri much less keep the competitive ones we have. We know therefore that a human resource capability factor must be included into the equation used to calculate gross state product. In plain words, our future and success

depends on how many highly skilled people Missouri can offer its business and industry.

Economies are characterized by what they accomplish and how they do so. Typically this is measured by both quantitative and qualitative indicators. The Gross National or State Product is an example of the former and the quality of life is an example of the latter. Intuitively the citizens of Missouri know that if the state's economy is strong, this necessarily means that there will be jobs available and that these jobs will include more of the high-paying, high-reward kind that they prefer to have. Furthermore, citizens have the sense that a stronger economy increases the amounts of money available to provide important services, such as education, and would permit them to insure that the nature of the work performed in the state is more environmentally sensitive. Both consequences are critical contributors to enhancement of their quality of life.

We also know that more and more of the work done in Missouri is technological in nature. Even more significant than this generalization, is that most of the high value, and thus highly paid, high quality work in the future will depend heavily on the capability of trades and crafts people, technicians, and technologists. Given the ever increasing rate of technological change we know that the present and future demand a higher level and quality of initial preparation for work (in both basic and technical skills); ongoing workforce development activity, i.e., retraining and upgrading, not just initial training; and an ability to be highly responsive to urgent emerging needs via both rapid institutional deployment and customized training.

What tends to be less well understood is the nature of the employment and business/industry in a state. What are the proportions between service and production jobs? What kinds of jobs are there and how do they distribute along the talent/preparation continuum? There has been a tremendous shift in the proportion of different types of jobs in technological societies such as the USA. Unskilled workers are projected to account for as little as 15% in the year 2000 and that managers are likely to shrink back to 20%. The amazing growth however, will occur within the ranks of the skilled and technologically capable people.

The importance of emphasizing technical education can be seen when examining the shifts in workforce demographics. The global competition combined with the technological revolution has resulted in a dramatic shift in the numbers of various types of workers. In the attempt to gain needed efficiencies and significant cost reductions, industry has drastically reduced the numbers of middle and higher management employees. At the same

time there have been fewer and fewer opportunities for the unskilled and semi-skilled. The consequence is that more and more of the growth in employment is found in the middle technical ranks where qualified and highly capable workers are in a position to create considerable "value added" thereby justifying good wages.

At the national level, considerable numbers of authors have commented that our society's workforce is comprised of relatively small proportions of jobs requiring a university education, i.e., a baccalaureate degree.

Analysis and observation both reveal significantly increasing proportions of technical work in the day to day affairs of Missouri's business, industries, and public sector institutions such as hospitals and schools. Seventy (70) percent of world trade is in manufacturing and that "Innovation and technology intensive sectors are particularly valuable in terms of contributing to a rising national income." Employment statistics demonstrate that many fewer unskilled workers are needed and increasing numbers of better qualified people are demanded—even in the face of greater efficiencies due to automation and other technology. This point was reinforced by President Clinton who (1993) stated:

> International competitiveness depends less and less on traditional factors such as access to natural resources and cheap labor. Instead, the new growth industries are knowledge based. They depend on the continuous generation of new technological innovations and the rapid transformation of these innovations into commercial products the world wants to buy. That requires a talented and adaptive work force capable of using the latest technologies and reaching ever-higher levels of productivity.

We also know that crafts, trade and technical work suffers from an inappropriate "attractiveness deficit"—particularly when considering how many of such people will be demanded by a successful economy and by how attractive such work has evolved to be, let alone how rewarding! Our collective perceptions are lagging reality—technical positions are increasingly more attractive in comparison to the traditional model of success, i.e., a college education. The reality is that technical jobs are increasingly rewarding and if current rates of salary increases continue, will exceed (by the year 2006) the average initial income of baccalaureate degree holders in a saturated market (see Figure 3).

Level of Education	Average Annual Earnings 1992	1994	1998	2002	2004	2006
Less than High School		$15,184				
High School Graduate		$20,696				
Some College		$22,984				
Associates Degree	$24,398	$26,156	$30,057	$34,540	$37,028	$39,693
Bachelors Degree	$32,629	$33,332	$34,830	$36,380	$37,180	$37,998
Skilled Apprenticeship	(not available)	$36,400 - $46,800				
Masters Degree		$42,432				
Doctorate		$51,168				
	From 1992 Census data	From 1994 Bureau of Labor Statistics	Projected based on 1992--> 1994 change			

From *Molly looks at the earnings numbers...*, VOCNET - NCRVE UC Berkeley Vocational Education Discussion List, VOCNET@cmsa.Berkeley.EDU, posted by Charles C. Jett, CCJETT@delphi.com, April 17, 1996.

Figure 3. Average Annual and Projected Earnings by Level of Education

The critical role of technology and technological capability is as true at the national level as it is in Missouri. This was made clear by President Clinton in "Moving Manufacturing Technologies to the Global Marketplace" (White House,n.d.) where he stated:

> ...the reality is that both American industry and government have under-invested in manufacturing technology, even though a strong manufacturing capability, like a highly skilled national workforce, is a critical determinant of the Nation's global economic competitiveness.

The special role of manufacturing and high technology was pointed out in "Technology and Trade: Competing in a Global Economy" and in "Putting Technology to Work for America's Future," (White House, n.d.) respectively:

> The manufacture and sale of high-technology products produces disproportionate benefits in boosting national productivity, raising worker skill levels, advancing technology development, and creating high-wage, stable jobs.
>
> High-technology products account for a rapidly increasing share of world manufacturing output, nearly doubling to about 35 percent since 1980. The United States, however, has not benefited fully from the boom in high-technology markets.
>
> New technology also underpins productivity increases, job creation, and gains in wages. The real wage of the average American worker

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increased eight-fold over the last century, the direct result of an eight-fold increase in average productivity. Advances in technology better machines, organizational improvements, and more-skilled workers account for as much as three-fourths of this productivity growth. In recent decades, however, declining rates of investment in production technologies have contributed to sluggish productivity growth. At the same time, the educational system has not produced adequate numbers of workers prepared for the modern workplace, resulting in a large pool of low-skilled workers being relegated to low-wage jobs. Over time, lagging investment in new technology contributes to a less-skilled workforce and, in turn, to worsening employment opportunities (lower-quality jobs and lower wages).

Why Technical Education Now?

The Commission on the Skills of the American Workforce (1990) in, *America's Choice: High Skills or Low Wages* concluded that the productivity of workers in jobs that do not require a college education will make or break our economic future. This national recognition contributed much to Missouri's context.

Missouri leadership recognized the forces described in the preceding paragraphs and, because of their personal and professional commitment to enhancing the opportunities for all within the state—opportunities for both individuals and business/industry—initiated action. The history of the state is replete with many efforts targeting on elementary and secondary education and on university level programming. Far less obvious is systematic attention to the post-secondary but less than baccalaureate level education that yields the bulk of the technical workforce fueling Missouri's capabilities.

Additionally, there is a congruence of priorities among the state's Governor, and his Cabinet officers, including the Commissioner of Higher Education, Commissioner of Education and the directors of the Departments of Economic Development, Labor and Industrial Relations and Social Services. This promotes collaborative work more than ever before. In short there is a clarity of purpose that has not previously existed.

But, this perception of urgency does not only exist among the state level leaders. Indeed, the state's practitioners and program administrators are also articulating a stronger, more coherent picture of the need for action. Emerging from a recent survey is a clear recognition of need for attention to technical education. This is reflected by calls for improved funding and

equipment so that programs can attain national accreditation status (Missouri programs are underrepresented in this category) and be more responsive to industry needs. Calls also surfaced for qualified instructors and students, the latter with the stronger mathematics, science, and communication competence needed to handle sophisticated, high level technical education programming and the technology used in high performance companies.

Clearly the economic and social climate in Missouri, as in the USA as a whole, is that of building the capacity for economic competitiveness. Missouri's people, their legislators and the state's industrial citizens are all and increasingly concerned with the quality of the state's workforce. Missouri industries, for example, are calling for more and better prepared workers to populate the entire spectrum of technical jobs (Associated Industries of Missouri, January, 1996). Nor is this just an idle claim as the AIM (1996) has documented that state wide "a skilled, educated workforce in Missouri has become a number one concern of many employers.

Gradually decision makers are recognizing the existence of an entire continuum of technology involved workers, ranging from the semi-skilled through trades/crafts persons, technicians, industrial and engineering technologists, engineers and scientists.

Not only are people calling for a skilled workforce, but they are also speaking towards a systematic rethink of the actual nature of technical education. In essence, they want students leaving schooling with a different and higher level set of competencies than before. This is clearly seen in the AIM (1996) report and earlier in various preceding Missouri documents as well as in the SCANs reports, the latter of course at the national level.

Current Context for Postsecondary Vocational Technical Education in Missouri

The major vehicle used for the delivery of technical/vocational educational opportunities in Missouri is provided through 445 local education agencies. In addition to these publicly supported programs, technical/vocational preparation is also provided by numerous private schools. The delivery system provides a full range of programs, services, and activities for the citizens within the State. The publicly supported local educational agencies include 424 comprehensive high school districts (53 of which reside within the area vocational technical school network), 12 community college districts with 16 campuses (4 with area vocational schools), 7 four-year institutions, and 2 state agencies. Ninety-five percent (95%) of the State's

citizens reside within 25 minutes of one of the area vocational technical schools leaving only 20 Missouri school districts that are not assigned to an area vocational technical district. Of the 452 comprehensive high school districts within the State, 433 participate in the area vocational school network.

Financial investments to support technical/vocational education in Missouri (FY 1995) totaled $20.9M federal, $45.4M state, and $84.5M local for programs, activities, and services. More than $115M has been invested in the construction of area vocational technical schools alone over the past thirty years, not to mention the sizeable investments that have been made in facilities at the community college and four-year levels. No data was available on the likewise sizeable investments that have been made by the private sector in facility construction, program, personnel, etc., in the delivery of technical/vocational education to Missouri citizens.

During the 1994-95 school year, more than 280,000 Missouri high school students and adults took part in technical/vocational programs including: 120,874 secondary, 47,885 post-secondary, and 101,914 adult. It is noteworthy, however, that less than 70,000 of the total technical/vocational enrollment (24%) are enrolled in industrial-based technical/vocational programs. This would include approximately 15,000 secondary, 37,000 adult, and 16,000 post-secondary participants.

It is noteworthy that, of the 20 fastest growing occupations in the 90's, nine are included in the industrial-based technical/vocational program category. These include: machinist, tool and die, welding, heating/air conditioning, electronics, mechanics (aviation & auto), machine service and repair, construction trades and printing. All of these occupations will require an extensive knowledge base and high skills if the completers are to adequately serve Missouri's demand for high-tech employees. Survey results, however, reveal that a relatively small percentage of the currently enrolled technical/vocational students are pursuing careers in these fast growing occupations. Of those enrolled, it appears that many of the programs are concentrated in the major metropolitan areas, yet the numbers enrolled there are not sufficient to meet the labor market demand. It is further apparent that, beyond the metropolitan areas, there exists a need for completers from these nine fast growing occupations, yet the number enrolled in out-state Missouri will not meet the projected labor market demand.

Definitions of Technical Education Terminology

For purposes of this state plan for postsecondary vocational technical education, the following definitions are used to clarify the meaning of the references to technical education, technicians, and technology.

Technical Education:

The heart of technical education is considered to be the postsecondary; i.e., one, two and three year programs; education that specifically develops human capabilities in technology. As such, technical education is best viewed as a continuum of systematic educational programs dealing with technology beyond high school but not extending to include the baccalaureate degree. Technical education typically develops the technicians, and others performing similar tasks but who are not called technicians, who work supportably with trades & crafts people, engineers, and management in technical roles.

Technicians:

Highly skilled and educated people engaged in work with sophisticated technology as a majority of their activity. Typically such people have one to three years post-secondary education that incorporates both a solid foundation of mathematics and science as well as in depth knowledge and skills in a field of technology (e.g., energy, power, instrumentation, control, materials processing, manufacturing, construction, communication and information). Technicians handle the tools, machines, materials and processes of industry. Typically they operate, and/or diagnose, maintain, repair, or install sophisticated production, communication, transportation or energy systems and equipment.

Technology:

Technology is taken to involve the processing of materials to increase value, typically via production and construction; the conversion, handling and control of energy and power; and the communication and handling of information and ideas. Technology operates in all sectors of the economy and life including prominent roles in manufacturing, service, transportation, health and agriculture.

Contextual Learning:

Contextual learning builds student competence from instruction that is delivered using an applied academic curriculum. The exercises taken

from the curriculum are designed for the learner to build upon his or her own personal experiences within an environment that is familiar to the learner, in context.

Missouri Vocational Technical Education Survey Findings

In conjunction with the development of this state plan for postsecondary vocational technical education, the resource group members appointed by the CBHE to advise on the development of the plan undertook a survey of secondary and postsecondary vocational technical education programs. The survey was agreed upon by the resource group members, administered by the College of Applied and Sciences and Technology at Central Missouri State University, and completed by the secondary and postsecondary area vocational and technical school directors, vocational education deans, and administrators. The following is an analysis of this assessment of Missouri vocational technical education delivery system.

Strengths and Weaknesses in Technical Education in Missouri

Program Admission Practices/Standards

- Nearly one-third of the respondents rated their impressions of standards of admission and recruitment/enrollment of qualified students into technical/vocational programs as weak to very weak at both the secondary and postsecondary levels, however

- Little or no emphasis was placed on such factors as: (1) recommendations by counselors, (2) personal interviews, (3) skill assessments, (4) background prerequisite in core courses (mathematics, science, and written communication), (5) previous grades earned, and (6) demonstrated attendance for entry into either secondary or postsecondary vocational technical education programs, yet

- Mathematics-, science-, and written communication-based concepts were seen as highly important to the success of students enrolled in technical/vocational programs, and

- The academic preparation of entering students in: (1) mathematics was ranked as the #1 concern of both the secondary and postsecondary levels, (2) science was ranked as the #4 major program concern at the secondary level and the #3 major program concern at the postsecondary

level, and (3) written communication was ranked as the #2 major program concern at the secondary level and the #5 major program concern at the postsecondary level, however

- More than five-sixths of the respondents did not use a cut-off score on the Ability-to-Benefit Test for students enrolled in technical/vocational programs, yet
- Less than one-third of the respondents plan to modify their program prerequisites over the next three years to increase the mathematics, science, and written communication requirements for students who will be entering their technical/vocational programs.

Accreditation/Certification

- More than four-fifths of the respondents rated instructor certification and program certification/accreditation as above average or higher in levels of importance, however

- Only one-fifth of all secondary and two-fifths of all postsecondary programs in Missouri schools which can be nationally certified/accredited are certified/accredited, and

- Only one-half of the secondary and one-fifth of the postsecondary schools plan to hire qualified instructors over the next three years to satisfy this deficiency, however

- Three-fifths of the secondary and two-fifths of the postsecondary respondents indicated that certification/accreditation would have a positive impact on their programs, and

- Over two-fifths of the secondary and three-fifths of the postsecondary respondents rated an increase in the professional development budget as essential.

Instructional Materials & Delivery

- Nearly nine-tenths of the respondents rated the quality of instructional materials that are available for their technical/vocational programs as good to very good at the secondary level (ranked as their #1 major program strength) and over four-fifths of the postsecondary respondents rated this item as good to very good (ranked as their #5 major program strength), and

- Over four-fifths of the secondary and more than three-fourths of the postsecondary respondents indicated they had good to very good opportunities for innovations in their technical/vocational program curriculum, and

- Over two-thirds of both the secondary and postsecondary respondents felt there was sufficient time available for the delivery of technical/vocational instruction.

Student Interest & Motivation

- Over two-thirds of the secondary respondents cited student interest and motivation as good to very good (ranked as the #5 major program strength), whereas this group also cited this item as a major weakness (ranked as the #3 major program concern), while

- Over four-fifths of the postsecondary respondents ranked student interest and motivation for their vocational technical education programs as good to very good (ranked as the #4 major program strength).

Administrative Support & Development

- Nearly nine-tenths of secondary respondents felt administrative support for their technical/vocational programs was good to very good (ranked as their #2 major program strength) and over two-thirds of the postsecondary respondence's cited administrative support as good to very good, and

- Over nine-tenths of the secondary respondents felt there was good to very good support for professional development activities with over four-fifths of the postsecondary respondents indicating that professional development activities for technical/vocational education was good to very good (ranked as their #1 major strength), however

- Nearly nine-tenths of the secondary respondents and nearly two-thirds of the postsecondary respondents rated opportunities for continued professional development activities as a high priority.

Quality and Amount of Equipment

- Nearly three-fourths of the secondary respondents (ranked as their #4 major program strength) and nearly two-thirds of the postsecondary respondents (ranked as their #2 major program strength) cited the quality of the laboratory equipment provided for vocational technical education programs, while adequate, is less than desirable or state-of-the-art; and
- Nearly three-fifths of both the secondary and postsecondary respondents rated the amount of equipment available for technical/vocational education as adequate, however, the postsecondary level also ranked this item as their #2 major program concern.

Funding

- Over one-half of all respondents cited funding for their technical/vocational programs as weak to very weak with much less than one-fifth of all respondents noting funding as strong to very strong, and

- Over two-fifths of the secondary respondents (ranked as the #5 concern) and nearly three-tenths of the postsecondary respondents rated funding for laboratory equipment as essential, and

- Over two-fifths of the respondents rated access to state-of-the-art equipment available for their technical/vocational programs as weak to very weak, and

- Nearly two-thirds of the secondary and four-fifths of the postsecondary respondents desire an increase in their technical/vocational program equipment budget, with nearly two-thirds of all respondents citing the need for an increase in their operations budget, and

- The average total annual equipment (new and repaired) expenditure for over one-half of all technical/vocational programs is less than $5,000 with over three-fourths of the programs at less than $10,000, and

- The average total annual operations (materials and supplies) expenditure for over two-thirds of all technical/vocational programs is less than $5,000 with over nine-tenths less than $10,000, and

- The average total annual expenditure for the entire program for nearly two-thirds of all of the technical/vocational programs is less than $50,000, and

- The average total capital outlay of equipment for the entire array of technical/vocational programs for over two-fifths of the schools is less than $50,000 with over two-thirds of the programs receiving less than $100,000.

Cooperative Education/Internships

- Less than two-thirds of the secondary and less than one-half of the postsecondary respondents ranked opportunities for cooperative education/internships as good to very good. In fact, the latter group ranked this item as their #4 major program concern.

Degree Completion

- Nearly all secondary completers receive a competency profile upon completion of their certificate or diploma, whereas less than three-fourths of postsecondary completers receive such a profile, and

- Over nine-tenths of all postsecondary completers receive an associate degree, whereas fewer and fewer postsecondary students are completing postsecondary, baccalaureate degrees.

Transfer/Articulation

- Less than two-thirds of the secondary institutions have transfer/articulation agreements with postsecondary community colleges and only one-half of this latter group has transfer/articulation agreements with postsecondary, four-year institutions. Less than one-sixth of all secondary institutions have established transfer/articulation agreements with postsecondary, four-year institutions, however,

- Less than one-half of the secondary respondents felt that the development of articulation agreements was important, whereas over three-fourths of the postsecondary institutions cited the need to establish transfer/articulation agreements as an agenda item.

Employment of Graduates

Over two-thirds of the secondary respondents felt that the number of jobs available to their graduates upon completion of their technical/vocational program was good to very good (ranked as their #3 major program strength) and nearly three-fourths of the postsecondary respondents cited the number of jobs available for their graduates was good to very good (ranked as their #3 major program strength).

Suggested New Technical Education Program Initiatives

Program Admission Practices/Standards

- Technical/Vocational education program recruitment needs a planned program. The standards of admission need to be strengthened and participants encouraged to seek rewarding/challenging career fields.

- The technical/vocational education programs need to mandate the use of recommendations (as business and industry do), personal interview, assessment of abilities prior, during, and after the training/education process, as well as the use of other predictors of success. The others include demonstrated attendance, background in core courses, and previously earned grades. Special emphasis needs to be placed on raising the ability of students to function at the average, above average, and strong levels in mathematics, writing-communications, and science.

- The individual programs, at all levels, need to define their prerequisites to prepare their students for success with not only math, writing-communications, and science, but with the knowledge necessary to gain the competencies to be successful in their chosen field of technical education.

Accreditation/Certification

- The programs of technical/vocational education need to be accredited/certified where there is existing credentialing available. In our present condition, this "can be done" with two-thirds of all programs. Post-secondary is in the lower quartile while secondary is still in the teens for accredited programs.

- Instructor certification should be encouraged in cooperation with an even stronger professional development program than exists for all instructors at all levels. The faculty have the support of their respective administrators.

- The direct benefit of having programs and instructors certified will enhance the outgoing student as he/she seeks employment in an industry where national standards are expected and/or the industry itself is seeking the ISO 14000 standards of achievement.

- Individual qualified faculty/instructors should have a professional development plan to acquire, maintain, and enhance their personal expertise. This will ensure their competency in their area of specialization.

- Curriculum should reflect the standards of the accreditation/ certification body. The program needs to be reflective of the industry, the accrediting agency, and the achievement of ISO 14000 standards.

- There exists in the state of Missouri, expertise and laboratory space in the various technical fields that can be used to enhance the skills of other less qualified instructors. These "Centers of Technical Education Excellence" (CTEE) should be utilized in a regular fashion for in-service professional development. This should be done in a cooperative effort within and between the 12 Regional Technical Education Councils, i.e., all welding in-service education should be done at the "best" welding program in the state.

- Certification of individual faculty/instructors should be a position requirement for hire.

Instructional Materials

- The quality of the instructional materials used in today's classroom should be further developed using the new media involving computer mediated processes.

- The instructors/faculty need budget support to access and utilize the technology in technical/vocational instruction. A significant portion (45%) of our instructors are average while 45% are strong/very strong.

- The diversity of instructional materials needs to continue to be a strength (73.7%) of the programs. This process may be enhanced by collaborative and consortium arrangements within regionals as well as across regions. All of these efforts will help to make the delivery of programs stronger (52.4%).

- Instructional materials are an integral part of the technical/vocational program delivery system. The competency profiles and curriculum materials have not only produced print and mediated instruction materials, but have given Missouri a place of national prominence in the field of technical/vocational education.

Student Interest and Motivation

- Student interest and motivation are kept at high levels with good instruction, state-of-the-art equipment and access, qualified up-to-date instructors, and a real industry linkage through internships and other real world situations

- High placement rates and job success encourages student interest and motivation.

- The general success of programs, the positive support of administration, and the enthusiasm of the faculty with their jobs, all lead to student success. Student success leads to high student interest and motivation.

- Assessment of student interest and motivation should be monitored in all programs.

Administrative Support and Development

- Assessment of administrative support and development should be a part of a annual program assessment.

- Professional development of faculty/instructors should be recorded for program improvement and certification/accreditation.

- Professional development of faculty should include certification/ accreditation of the faculty in their area of expertise.

Quality and the Amount of Equipment

- The use of state-of-the-art equipment is a paramount feature of a recognized highly successful programs. Access to equipment is also essential. The use of a select piece of technology-oriented equipment by individuals rather than "shared" use is desirable. Not to step back in time too far, but even Sloyd thought students should work with their own set of tools.

- The present well used, well maintained equipment is a quality we can be proud of. But, the equipment of the future will be, and is different. The technology, as well as the equipment, is changing as rapidly as the new car models each year. The 886 computer is not that far away.

- Funding is critical to the quality and the amount of equipment. Without state-of-the-art equipment of industry quality, the programs of technical/vocational education will not be successful for the student or the industry.

- The amount and quality of laboratory space must go hand-in-hand with the amount and quality of the equipment. Space and quality are rated at 53.2% and 64.6% respectively. While laboratory equipment is considered adequate, there is significant room for enhancement.

Funding

- A formula needs to be developed and implemented to ensure the adequate support of the technical/vocational education programs in the State. Weighting should be used to encourage the emerging technologies while maintenance support should be provided to the ongoing strong placement programs or other designated "Funding for Results" as incentives.

- The formula should include certification/accreditation incentives for both programs and instructors.

- Basic dollars are needed to start up and maintain the twelve Regional Technical Education Councils. All councils will have the same basic requirements and responsibilities. The Regional Councils should be financially supported (to a minimum) by local business, industry, and in-kind by their host community college and other higher education institutions, both public and private.

- Funding to support state-of-the-art equipment and its access is imperative. Supplies, materials, and capital outlay, on the whole, are not adequately supported to maintain the appropriate equipment that is needed to train the new workforce of the future.

- Without an unlimited supply of dollars, high cost, limited employment opportunities such as, "laser technology" should be limited to those persons needed to fill the projected openings. Only one or two such programs are needed at this point in time with the present industry and the projected demands for this occupation.

Cooperative Education/Internships

- Incentives should be used to encourage cooperative education/internships with industry related directly to the technical field.

- Business/industry in the region and state should be part of regional councils for assistance in curriculum, equipment acquisitions, professional development of staff, advisory committees and projections for employment, growth and emerging technologies.

- Internships should be an integral part of programs at all levels, secondary, post-secondary, 2-year, 4-year, public, and private.

- All avenues of interaction should be used to tie industry to education.

Degree Completion

- Incentives such as "Funding for Results" should be developed and awarded to encourage the completion of certificates, diplomas, associate and baccalaureate degrees. Special groups should receive special incentives.

- Tracking of entrants, participants, and exiters should be required to allow for an open entry/open exit with a meaningful professional development regardless of the level or location of the instruction. The "mobile" student may be meeting his changing needs over his lifetime.

- Competency profiles should be required at all levels regardless of the nature of the certificate, diploma, associate, or baccalaureate degree.

This profile should accompany the student/learner throughout their career.

- One could say, "the better the facility, the newer the state-of-the-art of the equipment, the currency of the motivational delivery systems, the update/experience of the faculty, the better the student's background in math, writing-communication, and science, and the higher the admission standards, the greater the opportunity for success of completion of the appropriate recognition (degree, etc.) by the student.

Articulation/Transfer

- Articulation/transfer is everyone's responsibility. The secondary programs need to make agreements with post-secondary (community college and/or four year both public and private). The post-secondary (community college) needs to do the same with the secondary and the four year. The four year (both public and private) needs to work with the community college and secondary schools. This all should function smoothly in the name of "seamless education."

- There will be written acceptance of each others certificates, associate degrees and course credits so that all parties are satisfied with the articulation/transfer agreements.

- All institutions in the State of Missouri should be bound to follow a set of guidelines for articulation/transfer. The standardization of courses should happen as it does in the multi-campus metropolitan colleges. Articulation conferences should "iron out" the differences. There should not be degrees with "no further education" in their descriptions.

Employment of Graduates

- The employment/placement of the graduates is good at 69.3% (#3 strength of positive issues). Job retention/advancement is good (62.8%) too. There is a need for an incentive to increase employment placement toward 100%. Under-placed programs should be reviewed for reduction, change, or deletion.

- Tracking of potential graduates will allow the technical/vocational administrator to plan for future educational activities related to specific field of study or CIP codes.

- Graduates, as part of their educational records, should be required to develop professional enhancement plans. These plans should remain flexible and be able to be modified as life and career change.
- Follow-up assessment of graduates should be done on a regular basis. Incentives for former students will be job advancement and salary increases. Further education of these former graduates should be an incentive for institutions to develop continuing education programs beyond the certificate, diploma, associate and baccalaureate degrees.

Technicians Needed by Missouri's Employer Community

According to a national report released in March 1995 by the National Science Foundation, entitled *Technical Education in 2-Year Colleges*, technicians needed in the nation's workforce must acquire useful skills and familiarity with science, mathematics, engineering, and technology and be prepared to embark immediately on careers as well as be prepared for further study. Central to the development of strategies to strengthen education for technicians and the development of these skills are changes which must be made in technological education through support of curriculum development and program improvements in science, mathematics, engineering, and technology established through collaborative efforts of academic institutions and between academe and industry. Such strategies are essential to advance major improvements in advanced technological education for science and engineering technicians and to ensure that enrollees acquire strong backgrounds in science and mathematics, and produce usable products sold at the international marketplace.

In addition, more science- and engieering-related technicans are needed across the country. A report from The Department of Labor referenced in the May 10, 1996 issue of *The Chronicle of Higher Education*, states that manufacturers annually need 98,000 new precision manufacturing technicians. Yet each year, only 20,000 people complete formal training programs in precision manufacturing at such institutions as community colleges and technical schools. A recent NBC News report indicated that 56 per cent of manufactures are having so much trouble finding workers of this type that they are hiring head hunters to recruit employees from abroad.

Examples of science and engineering technicians needed in Missouri include:

Machinist

The "general" title machinist refers to a person who sets up and operates conventional, special-purpose, and numerical control (NC) machines and machining centers to fabricate metallic and nonmetallic parts, and fits and assembles machined parts into complete units, apply knowledge of machine shop theory and procedures, shop mathematics, machinability of materials, and layout techniques. Machinist's need to be able to read blueprints, understand the manufacturing sequence of operations, and setup requirements. They also need a good understanding of mathematics, since they will calculate feeds and speeds of machines, as well as verifying dimensions and alignment of assembly and equipment parts.

Maintenance Employees

Maintenance employees, machine repairer, or general maintenance shop mechanic sets up a variety of machine tools, fits and assembles parts to fabricate or repair machine tools and maintains industrial machines by diagnosing machine malfunctions and determines the need for adjustment or repair.

Mechanics

Mechanics inspect, repair, and maintain functional parts of the metal working industry as well as inspects defective equipment and diagnosis malfunctions using manual and computerized methods.

General Equipment Operators

General equipment operators set up and operate machine tools, such as lathes, milling machines, boring machines, grinders, plastic molding machines, drills, and punch presses to machine metallic and nonmetallic workpieces according to specifications, tooling instructions, and standard charts as well as tending to one or more machine tools, special-purpose machines, or industrial robots to machine metal workpieces to specifications on production lines.

Tool and Die Makers

Tool and die makers analyze specifications, lays out metal stock, sets up and operates machine tools, and fits and assembles parts to fabricate and repair metalworking dies, cutting tools, jigs and fixtures, gauges, and machinists' handtools, applying knowledge of tool and die design and construction, shop mathematics, and metal properties, and layout, machining, and assembly procedures. Tool and die makers must be able to read blueprints, sketches, models, or descriptions, and visualize various products to determine the materials required.

Welders

Welders set up and operate arc welders, resistance welders, gas welders, etc., that weld together parts of fabricated metal products as specified by blueprints, layouts, welding procedures, and operating charts.

Solderers

Solderers solder together components to assemble fabricated metal items, as specified by work orders, diagrams, or layout prints, using a soldering iron, rule, square, handtools, or computer controlled robotic machines.

Screen Printers

Screen printers use computer controlled machines for printing designs and lettering on objects such as posters, targets, instrument dials, furniture, glass, fabric, magnets, and toys using a screen printing device.

Other manufacturing technicians needed to support the state's manufacturing employers for which Missouri has few programs to prepare such technicians include:

Electricians
Plastic and Composite Fabricators
Sheet Metal Fabricators
Quality Control Inspectors
Woodworkers
Experimental Shop Aides

Manufacturing support technicians in high demand by the state's manufacturing employers include:

Drafters
Engineering Aides
Facility Planners
Computer Analysts
Micro-computer Technicians
Computer Numerical Control Programmers
Research and Development Aides
Resource Planners
Technical Illustrators
Tool and Production Planners

The above listings of technicians working in manufacturing related industries do not preclude the need for the plan or framework for the delivery technical education providing for the preparation of an additional variety of specialists and technicians in fields related to agriculture production and processing, biochemicals, communications, integrated manufacturing and health. The focus of this plan is on manufacturing-related technical programs and technicians since so few exist and too few are being prepared in Missouri's schools, colleges, and universities at the certificate and associate degree level.

Regional Trade and Emerging Industrial Centers

Several social, economic, and demographic analyses of the state of Missouri were examined in the development of this state plan. These analyses demonstrate that the following communities should be considered in the initial implementation of the plan because they are located outside an existing community college taxing district, are identified as regional trade centers and/or developing a substantial industrial base and the communities have a need for local access to associate of applied science degree courses, programs, and related services. While some of these communities are homes to Missouri public four-year colleges and universities, most of these institutions have neither the approved institutional mission nor the postsecondary vocational technical associate of applied science degree programs to respond well to the type and level of education and training offered through the state's associate of applied science degree program

providers. The communities identified through these analyses included the following.

Branson	Joplin	Nevada
Cape Girardeau	Kirksville	Rolla
Chillicothe	Lebanon	Sikeston
Hannibal	Maryville	St. Joesph
Jefferson City	Mexico	West Plains

Three other communities are either regional trade centers or developing an industrial base but have an existing community college located within the community's city limits. These communities are Sedalia, Poplar Bluff, and Springfield. Other communities may be identified in the future through regional needs assessments as needing access to the state's associate of applied science degree program delivery system and related postsecondary vocational technical education services; one such community maybe Columbia, Missouri. In addition, as the infrastructure for the Coordinating Board's Plan for a Telecommunications-based Delivery System is established, other communities with identified needs for local access to the state's postsecondary vocational technical education delivery system potentially become points of access to the vocational technical education delivery system via telecommunications. One such community, of which there may be many, is Houston, Missouri.

APPENDIX B

SENATE BILL NO. 101

FIRST REGULAR SESSION
[TRULY AGREED TO AND FINALLY PASSED]
HOUSE COMMITTEE SUBSTITUTE FOR
SENATE COMMITTEE SUBSTITUTE FOR

SENATE BILL NO. 101

88TH GENERAL ASSEMBLY

AN ACT

To repeal sections 174.020, 176.010, 178.420, 178.530, 178.560 and 178.585, RSMo 1994, relating to higher education, and to enact in lieu thereof sixteen new sections relating to the same subject.

EXPLANATION—Matter enclosed in bold faced brackets [thus] in this bill is not enacted and is intended to be omitted in the law.

Be it enacted by the General Assembly of the State of Missouri, as follows:

Section A. Sections 174.020, 176.010, 178.420, 178.530, 178.560, and 178.585 RSMo 1994, are repealed and sixteen new sections enacted in lieu thereof, to be known as sections 174.020, 176.010, 178.420, 178 530 178.560, 178.585, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, to read as follows:

174.020. 1. The normal school at Warrensburg, Johnson County, shall hereafter be known as the "Central Missouri State College"; the normal school at Cape Girardeau, Cape Girardeau County, shall hereafter be known as the "Southeast Missouri State College"; the normal school at Springfield, Greene County, shall hereafter be known as the "Southwest Missouri State College"; the normal school at Maryville, Nodaway County, shall hereafter be known as the "Northwest Missouri State College"; the college at St. Joseph, Buchanan County,. shall hereafter be known as the "Missouri Western State College"; the college at Joplin, Jasper County, shall hereafter be known as the "Missouri Southern State College"; and the college in the city of St. Louis shall be known as 'Harris-Stowe State College".

2. When the conditions set forth in section 1 of this act are met, the technical college located in Osage County, commonly known as the East Campus of Linn Technical College, shall be known as "Linn State Technical College".

176.010. The following words and phrases as used in sections 176.010 to 176.080, unless a different meaning is plainly required by the context, shall have the following meanings:
(1) "Governing body" shall mean:
(a) The board of curators of the University of the State of Missouri;
(b) The board of curators of Lincoln University of Missouri;
(c) The board of regents for the Northeast Missouri State College;
(d) The board of regents for the Central Missouri State College;
(e) The board of regents for the Southeast Missouri State College;
(f) The board of regents for the Southwest Missouri State College;
(g) The board of regents for the Northwest Missouri State College;
(h) The board of regents for the Missouri Western State College;
(i) The board of regents for the Missouri Southern State College;
(j) The board of regents for Harris-Stowe State College;
(k) The board of trustees of any junior college district formed under sections 178.770 to 178.890, RSMo[.];
(l) The board of regents of Linn State Technical College, provided the conditions of section 1 of this act are met.
(2) "Net income and revenues" shall mean the income arising from the operation of a project remaining after providing for the costs of operation of such project and the costs of maintenance thereof.

(3) "Project" shall mean one or more dormitory buildings with or without dining room facilities as an integral part thereof, or dining room facilities

alone, or one or more social and recreational buildings, or any other revenue producing facilities of state educational institutions, or any combination of such facilities.

(4) "Revenue bonds" shall mean bonds issued hereunder for the purposes herein authorized and payable, both as to principal and interest, solely and only out of the net income and revenues arising from the operation of the project for which such bonds are issued after providing for the costs of operation and maintenance of such project, and, in addition thereto, in the discretion of the governing body, out of either one or both of the following sources:

(a) The proceeds of any grant in aid of such project which may be received from any source; and

(b) The net income and revenues arising from the operation of another project, as herein defined, already owned and operated by any such state educational institution. Such bonds shall not be deemed to be an indebtedness of the state of Missouri, the educational institution issuing them, the governing body of such educational institution, or the individual members of such governing body.

(5) "State educational institutions" shall mean and shall include:

(a) The state University of Missouri, incorporated as a body politic under the name of "The Curators of the University of Missouri", together with the departments of said state university especially established by law as the "College of Agriculture at Columbia" and the "University of Missouri-Rolla";

(b) "Lincoln University" at Jefferson City;
(c)The several state teachers colleges, to wit:
"Northeast Missouri State University" at Kirksville, Missouri;
"Central Missouri State College" at Warrensburg, Missouri;
"Southeast Missouri State College" at Cape Girardeau, Missouri;
"Southwest Missouri State College" at Springfield, Missouri;
"Northwest Missouri State College" at Maryville. Missouri;
(d) Junior college districts formed under sections 178.770 to 178.890, RSMo;
(e) The several state colleges, to wit:
"Missouri Western State College" at St. Joseph, Missouri;
"Missouri Southern State College" at Joplin, Missouri;

"Harris-Stowe State College" at St. Louis, Missouri[.];
"Linn State Technical College" in Osage County, Missouri, provided the conditions of section 1 of this act are met.

178.420. Unless a different meaning is clearly required by the context, the following words and phrases as used in sections 178.420 to 178.580 mean:

(1) ["Full-time technical school", a facility which is maintained by a board of education of a six-director school district, prior to January 1, 1991, solely for postsecondary education which offers a vocational and technical education program leading to the granting of certificates, diplomas, associate degrees or a combination thereof, but not including baccalaureate or higher degrees, the controlling purpose of which is to prepare students for profitable employment;

(2)] "Prevocational education", education of less than college grade which gives children an elementary acquaintance with different vocational activities, arts or occupations and better prepares them to make an intelligent choice of a vocation;

(2) "Linn State Technical College", a public institution with an independent governing board, appointed by the governor ant confirmed by the senate, that has been designated by the general assembly to provide only postsecondary vocational and technical education programs leading to the granting of certificates, diplomas, associate of applies science degrees or a combination thereof, but not including associate of the arts or baccalaureate or higher degrees, the controlling purpose of which is to prepare students for profitable employment;

(3) "Vocational education", education of less than college grade, the controlling purpose of which is to fit for profitable employment.

178.530. The state board of education shall establish standards and annually inspect, as a basis for approval, all public prevocational, vocational [and full-time technical] schools, **Linn State Technical College**, departments and classes receiving state or federal moneys for giving training in agriculture, industrial, home economics and commercial subjects and all schools, departments and classes receiving state or federal moneys for the preparation of teachers and supervisors of such subjects. The public prevocational[,] **and** vocational [and full-time technical] schools, **Linn State Technical College**, departments, and classes, and the training

schools, departments and classes are entitled to the state or federal moneys so long as they are approved by the state board of education, as to site, plant, equipment, qualifications of teachers, admission of pupils, courses of study and methods of instruction. All disbursements of state or federal moneys for the benefit of the approved prevocational[,] **and** vocational [and full-time technical] schools, **Linn State Technical College,** departments and classes shall be made semiannually. The school board of each approved school **or the governing body of Linn State Technical College** shall file a report with the state board of education at the times and in the form that the state board requires. Upon receipt of a satisfactory report, the state board of education shall certify to the commissioner of administration for his approval the amount of the state and federal moneys due the school district **or Linn State Technical College.** The amount due the school district shall be certified by the commissioner of administration and proper warrant therefor shall be issued to the district treasurer **or Linn State Technical College.**

178.560. The school board of any school district **or the governing board of Linn State Technical College** maintaining a prevocational[.] **or** vocational [or full-time technical] school, **Linn State Technical College,** department or class receiving the benefit of state or federal moneys under the provisions of sections 178.420 to 178.580 as a condition of approval by the state board of education and the state commissions of education, shall appoint persons of experience in agriculture, industry, home economics and commerce to give advice and assistance to the school board or **governing board** in the establishment and maintenance of the schools, department and classes. The persons of experience shall serve without compensation.

178.585. 1. Under rules and regulations of the state board of education, the commissioner of education, in cooperation with the director of the division employment security of the department of labor and industrial relations, shall establish procedures to provide grants to public high schools, vocational-technical schools, **Linn State Technical College,** and community colleges solely for the purpose of new programs, curriculum enhancement, equipment and facilities so as to upgrade vocational and technical education in the state.

2. Each vocational-technical school, community college, **Linn State Technical College,** and school district of any public high school receiving a grant authorized by this section shall have an advisory committee composed of local business persons, labor leaders, parents, senior citizens, community

leaders and teachers to establish a plan to ensure that students who graduate from the vocational-technical school, community college, **Linn State Technical College,** or public high school proceed to a four-year college or high wage job with workplace skill development opportunities.

3. Beginning July 1, 1994, the director of the division of employment security of the department of labor and industrial relations shall provide annually to the commissioner of education a listing of demand occupations in the state including substate projections. The listing shall include those occupations for which, in the judgment of the director of the division of employment security, there is a critical shortage to meet present or future employment needs necessary to the economic growth and competitiveness of the state.

4. In any fiscal year, at least seventy-five percent of all moneys for the grant awards authorized by this section shall be to public high schools vocational-technical schools, **Linn State Technical College,** or community colleges for new programs curriculum enhancement or equipment necessary to address demand occupations identified pursuant to subsection 3 of this section.

Section 1. If the facilities, equipment, and adjoining grounds of Linn Technical College located in Osage County and commonly known as the East Campus of Linn Technical College, as well as the cash reserves of Linn Technical College are made available to the state of Missouri as a gift by the Osage R-II School District, there shall be established at that site a state technical college, to be known as "Linn State Technical College".

Section 2. The governing board of Linn State Technical College shall be a board of regents composed of seven voting members and one nonvoting student member. Such members shall be appointed by the governor with the advice and consent of the senate after the effective date of this section and after the conditions of section 1 of this act are satisfied. No person shall be appointed to the board who is not a citizen of the United States and who has not been a resident of the state of Missouri for at least two years immediately prior to his appointment. Not less than three voting members shall belong to one of the two major political parties and not less than three shall belong to the other major political party. Not more than two voting members shall reside in Osage County or other immediately contiguous counties.

Section 3. Voting members of the board shall be appointed for terms of six years, except that of the voting members first appointed, two shall serve for two years, two for four years, and three for six years. The terms and conditions of service for nonvoting members shall be the same as provided by law for the University of Missouri.

Section 4. The board of regents of Linn State Technical College, while attending the meetings of the board, shall receive their actual and necessary expenses, which shall be paid out of the ordinary revenues of the institution. Vacancies in terms of office caused by death, resignation or removal shall be filled in the manner provided by law for such vacancies on the board of curators of the University of Missouri.

Section 5. 1. The board of regents of Linn State Technical College shall organize in the manner provided by law for the board of curators of the University of Missouri. The powers, duties, authority, responsibilities, privileges, immunities, liabilities and compensation of the board of Linn State Technical College in regard to Linn State Technical College shall be the same as those prescribed by statute for the board of curators of the University of Missouri in regard to the University of Missouri, except that Linn State Technical College shall be operated only as a state technical college. Nothing in this section shall be construed to authorize Linn State Technical College to become a community college or a university offering four year or graduate degrees.

2. All lawful bonded indebtedness incurred by the issuance of revenue bonds, as defined in section 176.010, RSMo, by Linn Technical College, shall be deemed to be an indebtedness of the board of regents of Linn State Technical College after the date upon which the conditions of section 1 of this act are met. Such indebtedness shall be retired through tuition revenues.

Section 6. 1. Linn State Technical College shall be a special purpose institution that shall make available to students from all areas of the state exceptional educational opportunities through highly specialized and advanced technical education and training at the certificate and associate degree level in both emerging and traditional technologies with particular emphasis on technical and vocational programs not commonly offered by community colleges or area vocational technical schools. Primary consideration shall be placed on the industrial and technological manpower needs of the state. In addition, Linn State Technical College is authorized to assist the state in economic development initiatives and to facilitate the transfer of technology to Missouri business and industry directly through the

graduation of technicians in advanced and emerging disciplines and through technical assistance provided to business and industry. Linn State Technical College is authorized to provide technical assistance to area vocational technical schools and community colleges through supplemental on-site instruction and distance learning as such area vocational technical schools and community colleges deem appropriate.

2. Consistent with the mission statement provided in subsection 1 of this section, Linn State Technical College shall offer vocational and technical programs leading to the granting of certificates, diplomas, and applied science associate degrees, or a combination thereof, but not including associate of arts or baccalaureate or higher degrees. Linn State Technical College shall also continue its role as a recognized area vocational technical school as provided by policies and procedures of the state board of education.

Section 7. 1. Within twelve months after this section becomes effective and after the conditions of section 1 of this act are satisfied, the board of regents of Linn State Technical College shall submit to the coordinating board for higher education, for the approval of the coordinating board, a five-year plan outlining the changes necessary for the institution to realize its new mission as a state technical college. The plan shall include, but shall not be limited to, such issues as admissions policies, new degrees programs to be developed, plans for attaining regional accreditation as a postsecondary institution, provisions for assessment of student learning and overall institutional performance, a fiscal plan for achieving institutional priorities measurable goals and objectives for the institution, and specific provisions for coordinating with existing community colleges and area vocational technical schools. As this plan is developed it shall be assumed that tuition and fees for this institution shall be comparable to public four-year institutions rather than public two-year institutions. A copy of the five year plan shall also be submitted to the state board of education for its review and comment, and the coordinating board shall give due consideration to the views of the state board in its approval process for the plan.

2. Within twelve months after this section becomes effective and prior to completing action on any five-year mission implementation plan submitted by Linn State Technical College, the coordinating board for higher education shall complete, in cooperation with the state board of education, a comprehensive assessment of postsecondary vocational technical education in the state of Missouri. Such study shall include, but not be limited to the adequacy of Missouri's delivery system for postsecondary vocational

technical education, including the role of area vocational schools and community colleges, in meeting the needs of the state and its citizens, businesses, and industries for vocational technical education opportunities of high quality in terms of the quality of its services, its arrangements for efficient and effective governance, and its method and level of financing. This study shall develop a master plan for advanced technical and vocational training in the state of Missouri coordinating area vocation school sites with area community colleges and Linn State Technical College to form advanced vocational and technical training facilities. The plan shall establish a mechanism for meeting the needs of citizens, business and industry in this state with the goal of obtaining a skilled, high demand workforce. The plan shall contain a means of funding advanced technical and vocational training in line with a strong state policy for a highly skilled, in demand workforce. The plan shall further set forth a mechanism for coordination of the delivery system between Linn State Technical College, area community colleges and area vocational schools within the service districts of the respective community colleges. Programs to be offered and funded by the state shall be contemplated by the plan. Funding of the programs offered may be tied to cooperation of area vocational schools and area community colleges; except that, no mandates may be included on any program which is funded in whole or in part by local funds, unless the cost of the program is paid by the state. The plan shall further indicate and anticipate the role of telecommunications in delivery of classes between Linn State Technical College, area community colleges and area vocational sites. The coordinating board shall make such recommendations regarding any improvements in the postsecondary vocational education delivery system as it deems appropriate and shall report its findings to the governor, the speaker of the house of representatives, the president pro tempore of the senate, and the state board of education.

3. After the conditions of this section and section 1 of this act are satisfied, Linn State Technical College shall be deemed to be a qualified college, university, or educational institution for the purposes of any higher education, student loan, grant, or scholarship program established pursuant to state law.

Section 8. Linn State Technical College shall be under the oversight of the coordinating board for higher education. The institution shall also be subject to oversight by the state board of education to the extent it serves as an area vocational technical school. Beginning in the first full state fiscal year subsequent to the approval of Linn State Technical College's plan by the coordinating board submitted pursuant to section of this act, the state of

Missouri shall, subject to appropriation, provide the funds necessary to provide the staff, cost of operation, and payment of all new capital improvements commencing with that fiscal year. All funds designated for the institution shall be included in the coordinating board's budget request as provided in chapter 173, RSMo, except that vocational technical education reimbursements shall continue to be requested through the state board of education.

Section 9. Any person who becomes an employee of the Linn State Technical College after the conditions of section 1 of this act are met shall become a member of the Missouri state employees' retirement system, if the person otherwise meets the requirements for membership in that system.

Section 10. 1. Employees of the technical college commonly known as the Linn Technical College, who become employees of the Linn State Technical College on the date the conditions of section 1 of this act are met, shall, on that date, become members of the Missouri state employees' retirement system if they otherwise meet the requirements for membership in that system.

(1) Any such employee who had been contributing to a retirement system established by sections 169.010 to 169.141 or 169.600 to 169.715, RSMo, may elect one of the following:

(a) All creditable service with the public school retirement system of Missouri or the nonteacher school employee retirement system of Missouri resulting from employment with the Linn Technical College shall be forfeited and an equal amount of service shall be transferred to and recognized as prior creditable service by the Missouri state employees' retirement system, and the member, upon application, shall receive a refund of accumulated contributions associated with such transferred service from the system to which member contributions had been made; or

(b) All creditable service with the public school retirement system of Missouri or the nonteacher school employee retirement system, regardless of the source of such creditable service, shall be recognized by the applicable system and the person, notwithstanding any of the provisions of chapter 169, RSMo, shall immediately vest in the applicable system and, upon attainment of the minimum retirement age of the applicable system, be entitled to a monthly benefit based on such creditable service and the law in effect at the time of retirement, provided the person does not withdraw accumulated contributions associated with such creditable service.

(2) With respect to those persons electing to receive a refund under, paragraph (a) of subdivision (l) of this section, the public school retirement system of Missouri or the nonteacher school employee retirement system of Missouri, whichever is applicable, shall transfer to the Missouri state employees' retirement system an amount equal to the actuarial accrued liability for the forfeited creditable service, determined as if the person were going to continue to be an active member of the public school retirement system of Missouri or the nonteacher school employee retirement system as applicable, less the amount of any refunds of member contributions. In addition, notwithstanding any of the provisions of chapter 169, RSMo, any person who elects to receive a refund under paragraph (a) of subdivision (1) of this section and has creditable service with the public school retirement system of Missouri or the nonteacher school employee retirement system of Missouri resulting from employment with any employer other than the Linn Technical College shall, with respect to such service, immediately vest in the applicable system and, upon attainment of the minimum retirement age of the applicable system, be entitled to a monthly benefit based on such creditable service and the law in effect at the time of retirement, provided the person does not withdraw accumulated contributions associated with such creditable service.

(3) The election under subdivision (l) of this section shall be made within ninety days after the conditions of section 1 of this act are met. Any person who fails to make an election within that period shall be deemed to have elected to be governed by paragraph (a) of subdivision (1) of this section.

2. In no event shall any person receive service credit for the same period of service under more than one retirement system as a result of the provisions of this act.

Senate Bill 101

APPENDIX C

LIST OF AREA BUSINESS LEADERS INVOLVED IN THE PLANNING DISCUSSIONS

List of Area Business Leaders Involved in the Planning Discussions

Woody Kahl
Trenton Foods Division of Nestle
Trenton, MO 64683

Ulf Langaard
Alfa Laval Corporation
Chillicothe, MO 64601

Friskies R. & D. Center
Perry Moyle
Premium Standard Foods
Milan, MO 63556

Julie Bass
Landmark Manufacturing
Gallatin, MO 64640

Darryl Burks
Wire Rope Corporation
Chillicothe, MO 64601

Alice Bartlett
Wire Rope Corporation
Chillicothe, MO 64601

Bill Bassitt
President
St. Joseph Chamber of Commerce
St. Joseph, MO 64506

Bill Field
Vice President of Manufacturing
Altec Industries, Inc.
St. Joseph, MO 64506

Joe Mazur
Pres. St. Joseph Chamber Board
Shamrad Metal Fabricators
St. Joseph, MO 64503

Bob Foley
Manager, Human Resource Dpt.
St. Joseph, MO 64503

Joe Gray
CEO
Gray Automotive Products Co.
St. Joseph, MO 64501

Charles Roster
Business Representative
Plumber Steamfitters Local #45
St. Joseph, MO 64506

Terry Steinbecker
President
St. Joseph Light & Power
St. Joseph, MO 64501

Rudy Wacker
Vice President, Personnel Dept.
Heartland Health System
St. Joseph, MO 64506

Lee Keith
Vice President
Heritage Bank of St. Joseph
St. Joseph, MO 64507

Jim Lynch
Plant Manager
Quaker Oats Company
St. Joseph, MO 64503

Dan Colgan
Superintendent
St. Joseph Public School District
St. Joseph, MO 64501

Senator Sidney Johnson
Missouri State Senate
State Capitol Building
Jefferson City, MO 65101

Troy Long
Employee Supervisor
Noranda Aluminum, Inc.
New Madrid, MO 63869

Pat Hagan
ETM Facilitator
Dana Corporation
Cape Girardeau, MO 63703

Cathy Welsh
Manager of Training & Develop.
TG(USA) Corporation
Perryville, MO 63775

Dennis Scanga
Manager of Employee Develop.
Huffy Bike Company
Farmington, MO 63640

Mike Wicklund
President
Missouri Forge, Inc.
Doniphan, MO 63935

Anita Coulter
Kawasaki Motors USA.
Maryville, MO 64468

Charles Mullican
Vice President Medical Affairs
Heartland Health System
St. Joseph, MO 64507

Russ Neal
Transaction Technologies Inc.
Union, MO 63084

Jack R. Grisbrook
Saint Clair Die Casting Co.
St. Clair, MO 63077-0280

Walt Luther
Magnet Inc.
Washington, MO 63090

Barbara A. Richter
The Childrens Factory
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Personnel Manager
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Ron Douglas, Jr.
President
Technical Plastics, Inc.
Poplar Bluff, MO 63901

Dick Hinze
Personnel and Safety Manager
Hudson Foods Inc.
Dexter, MO 62841

Barbara Tindall
Training Coordinator
Emerson Electric Company
Kennett, MO 63857

Jerry Grahl
LMP Steel and Wire
Maryville, MO 64468

Jim Timerlake
Vice President for Operations
Link Electronics
Cape Girardeau, MO 63701

Dave Anderson
Moog Automotive
Maryville, MO 64468

Dale Grothe
Personnel Manager
Good Humor-Bryers
Sikeston, MO 68801

Jim Garrison
Con-Agra Frozen Foods
Milan, MO 63556

Barry Parks
Director of Human Resources
Positronics Industries
Springfield, MO 65806

Larry Leininger
Modine Manufacturing
Trenton, MO 64683

Phil Davis
Reliable Chevrolet
Springfield, MO 65807

Fred Ernst
Copeland Corporation
Lebanon, MO 65802

Bob Carter
President
Webco Engineering
Springfield, MO 65802

Bill Cary
W. R. Cary Engineering
Springfield, MO 65802

APPENDIX D

TECHNICAL EDUCATION RESOURCE GROUP

CHARGE AND MEMBERS

TECHNICAL EDUCATION RESOURCE GROUP CHARGE

The Coordinating Board for Higher Education (CBHE) is directed by Senate Bill 101, passed by the Eighty-eighth General Assembly and signed into law by Governor Carnahan, to undertake a comprehensive assessment of postsecondary vocational technical education in the state of Missouri, in cooperation with the State Board of Education. The CBHE is to develop a master plan for advanced technical education and vocational training that coordinates area vocational schools, community colleges, and Linn State Technical College to provide advanced vocational and technical training for the state of Missouri.

At its October 1995 meeting, the Board directed the Commissioner of Higher Education to appoint a work group of college and university representatives, advisors, and others to assist with this undertaking. The Technical Education Resource Group will work with the full Board, acting as the Blueprint Executive Planning Committee, to design a comprehensive plan for postsecondary technical education for inclusion in a *Blueprint for the Future of Missouri's Higher Education System*

The Technical Education Resource Group is charged with:

- Reviewing the current postsecondary technical education delivery system and suggesting changes and improvements necessary for the development of a high skill, high wage workforce.

- Identifying priority degree program areas that are crucial to development of this workforce and that should receive state funding.

- Proposing a mechanism to identify and meet the state's future workforce technical education needs.

- Developing a framework for the coordination of the various state delivery systems for technical education, including Linn State Technical College, public community colleges and area vocational schools.

- Developing a plan to integrate telecommunications technology into the delivery of classes among the community colleges, area vocational schools, and Linn State Technical College.
- Proposing a mechanism to provide funding sufficient to ensure the development and maintenance of a system of advanced technical education of sufficient scope and quality to produce a well-educated and highly trained workforce.

- Presenting a report to the CBHE at its June 13, 1996 meeting.

LINN STATE TECHNICAL COLLEGE FIVE-YEAR PLAN RESOURCE GROUP CHARGE

Senate Bill 101. passed by the Eighty-eighth General Assembly and signed into law by Governor Carnahan, creates a Board of Regents for Linn State Technical College and directs the Board to submit for approval to the Coordinating Board for Higher Education (CAB) a five-year plan outlining the changes necessary for the institution to realize its new mission as a state technical college. The law designates Linn State Technical College as a special purpose to make available to students from all areas of the state exceptional educational opportunities in highly specialized and advanced technical education and training at the certificate and associate degree level in both emerging and traditional technologies with particular emphasis on technical and vocational programs not commonly offered by community colleges or area vocational schools. Further, Linn State Technical College is to:

- give primary consideration to industrial and technological manpower Deeds of the state;
- assist the state in economic development initiatives;
- facilitate the transfer of technology to Missouri business and industry directly though the graduation of technicians in advanced and emerging disciplines and through technical assistance provided to business and industry;
- provide technical assistance to area vocational technical schools and community colleges through supplemental on-site instruction and distance learning as such area vocational technical schools and community colleges deem appropriate;
- offer vocational and technical programs leading to the granting of certificates, diplomas, and applied science associate degrees, or a combination thereof, but not including the associate of arts or baccalaureate or higher degrees; and
- continue its role as a recognized area vocational technical school.

The Board of Regents for Linn State Technical College will submit to the CBHE for approval a five-year mission implementation plan outlining the changes necessary for the institution to realize its new mission as a state technical college. In particular, the plan will address:

- admissions policies; new degree programs to be developed;
- plans for attaining regional accreditation as a postsecondary institution;
- provisions for assessment of student learning and overall institutional performance;
- a fiscal plan for achieving institutions priorities;
- measurable goals and objectives for the institution; and
- specific provisions for coordinating with existing community colleges and area vocational technical schools.

The CBHE has, therefore, directed the Commissioner of Higher Education to appoint a work group of college and university representatives. advisors, and others to assist with this undertaking. The work group, named the Linn State Technical College Five-year Plan Resource Group, is charged with:

- Assisting with the design of a five-year mission implementation plan for Linn State Technical College and making recommendations to the LSTC Board of Regents (upon appointment) for their review and consideration prior to the Board's submission of the plan to the CBHE;
- Integrating the five-year plan's recommendations within the parameters and guidelines of the statewide master plan for postsecondary technical education being developed by the Board's Resource Group for Technical Education; and

Assisting the board of regents for Linn State Technical College in presenting the five-year plan to the CBHE at its June 13, 1996 meeting.

Technical Education Resource Group Members

Public Four-year Colleges and Universities

Janet, Murphy, President, Missouri Western State College
Ed Elliott, President, Central Missouri State University

Public Two-year Community Colleges

Wayne Giles, Chancellor, Metropolitan Community Colleges
Marvin Fielding, President, State Fair Community College
Irving P. McPhail, President, St. Louis Community College-Florissant Valley

Private Colleges

C. R. LeValley, President, DeVry Institute of Technology - Kansas City

DESE

Russell McCampbell, Assistant Commissioner for Vocational and Adult Education, Department of Elementary and Secondary Education

Area Vocational Technical Schools

Doug Stewart, Director, N.S. Hillyard Area Vocational Technical School, St. Joseph

Missouri State Council on Vocational Education

DeeDee Schlichting, Executive Director, Missouri State Council on Vocational Education

Resource Group Members Focusing On: Linn State Technical College Master Plan

CBHE Liaison

Ray Henry

Public Two-year Community Colleges

Dale Gibson, President, East Central Community College
Norman Myers, President, Ozarks Technical Community College

Public Four-year Colleges and Universities

Wendell Rayburn, President, Lincoln University
Randy Shaw, Chair, Industrial Technology & Vocational Coordinator, Southeast Missouri Sate University

DESE

Dennis Harden, Director, Industrial Education, Division of Vocational and Adult Education, Department of Elementary and Secondary Education

ASHRAE

Philip Sutherlin, Vice President, McClure Engineering, St. Louis

Advisors

Robert A. Robison, Coordinator of Vocational Education, Department of Elementary and Secondary Education

Fred Linhardt, Director, Vocational Planning and Evaluation, Division of Vocational and Adult Education, Department of Elementary and Secondary Education

Bob Stewart, Professor and Chairman, Department of Practical Arts and Vocational-Technical Education, University of Missouri-Columbia

Michael Dyrenfurth, Professor, Technology and Industry Education, University of Missouri-Columbia

Harley Schlichting, Director, Instructional Materials Laboratory, Practical Arts and Vocational-Technical Education, University of Missouri-Columbia

Art Rosser, Dean, College of Applied Science and Technology, Central Missouri State University

Bill Downs, Assistant Dean, College of Applied Science and Technology, Central Missouri State University

Tim Haithcoate, Director, Geographic Information Resources Center, University of Missouri-Columbia

Daryl Hobbs, Director, Office of Social and Economic Data Analysis, University of Missouri-Extension Division

Ryan Burson, State Demographer

Don Claycomb, President, Linn State Technical College

Ray Walsh, Director, Southeast Missouri Regional Tech-Prep Consortium, Park Hills, Missouri

Staff

John Wittstruck, Associate Commissioner, Coordinating Board For Higher Education

Don Watson, Intern, Coordinating Board For Higher Education

APPENDIX E

PART E OF CARL D. PERKINS VOCATIONAL AND APPLIED TECHNOLOGY EDUCATION ACT

EXCERPTS FROM THE PERKINS VOCATIONAL AND APPLIED TECHNOLOGY ACT

Part E Tech-Prep Education.

SEC. 341. SHORT TITLE.

This part may be cited as the 'Tech-Prep Education Act.'

SEC. 342. FINDINGS AND PURPOSE

(a) FINDINGS.—The Congress finds that—

(1) rapid technological advances and global economic competition demand increased levels of skilled technical education preparation and readiness on the part of youths entering the workforce;

(2) effective strategies reaching beyond the boundaries of traditional schooling are necessary to provide early and sustained intervention by parents, teachers, and educational institutions in the lives of students;

(3) a combination of nontraditional school-to-work technical education programs, using state-of-the-art equipment and appropriate technologies, will reduce the dropout rate for high school students in the United States and will produce youths who are mature, responsible, and motivated to build good lives for themselves;

(4) the establishment of systematic technical education articulation agreements between secondary schools and postsecondary educational institutions is necessary for providing youths with skills in the liberal and practical arts and in basic academics, including literacy instruction in the English language, and with the intense technical preparation necessary for finding a position in a changing workplace;

(5) by the year 2000 an estimated 15,000,000 manufacturing jobs will require more advanced technical skills, and an equal number of service jobs will become obsolete;

(6) more than 50 percent of jobs that are developing will require skills greater than those provided by existing educational programs;

(7) dropout rates in urban schools are 50 percent or higher, and more than 50 percent of all Hispanic youth drop out of high school; and

(8) employers in the United States pay an estimated $210,000,000,000 annually for formal and informal training, remediation, and lost productivity as a result of untrained and unprepared youth joining, or attempting to join, the workforce of the United States.

(b) PURPOSE.—It is the purpose of this part—

(1) to provide planning and demonstration grants to consortia of local educational agencies and postsecondary educational institutions, for the development and operation of 4-year programs designed to provide a tech-prep education program leading to a 2-year associate degree or a 2-year certificate; and

(2) to provide, in a systematic manner, strong, comprehensive links between secondary schools and postsecondary educational institutions.

SEC. 343. PROGRAM AUTHORIZED

(a) DISCRETIONARY AMOUNTS.—In any fiscal year in which the amount made available under section 3(d)(1)(E) to carry out the provisions of this part is equal to or less than $50,000,000, the Secretary, in accordance with the provisions of this part which are not inconsistent with this paragraph, shall award grants for tech-prep education programs to consortia of —

(1) local educational agencies, intermediate educational agencies or area vocational education schools serving secondary school students, or secondary schools funded by the Bureau of Indian Affairs; and

(2a) nonprofit institutions of higher education which offer a 2-year associate degree program, a 2-year certificate program, and which are qualified as institutions of higher education pursuant to section 481(a) of the Higher Education Act of 1965, including institutions receiving assistance under the Tribally Controlled Community College Assistance Act of 1978, or a 2-year apprenticeship

program that follows secondary instruction, if such nonprofit institutions of higher education are not subject to a default management plan required by the Secretary; or

(2b) proprietary institutions of higher education which offer a 2-year associate degree program and which are qualified as institutions of higher education pursuant to section 481 (a) of the Higher Education Act of 1965 if such proprietary institutions of higher education are not subject to a default management plan required by the Secretary.

(b) STATE GRANTS.—

(1) In any fiscal year for which the amount made available under section 3(d)(1)(E) to carry out the provisions of this pan exceeds $50,000,000, the Secretary shall allot such amount to the States in accordance with the provisions of section 101 (a)(2).

(2) From amounts made available to each State under paragraph (1), the State board, in accordance with the provisions of this part which are not inconsistent with this paragraph, shall award grants on a competitive basis or on the basis of a formula determined by the State board, for tech-prep education programs to consortia described in subsection (a)(1).

SEC. 344. TECH-PREP EDUCATION PROGRAMS.

(a) GENERAL AUTHORITY.—Each grant recipient shall use amounts provided under the grant to develop and operate a 4-year tech-prep education program.

(b) CONTENTS OF PROGRAM.—Any such program shall

(1) be carried out under an articulation agreement between the participants in the consortium;

(2) consist of the 2 years of secondary school preceding graduation and 2 years of higher education or an apprenticeship program of at least 2 years following secondary instruction, with a common core of required proficiency in mathematics, science, communications, and technologies designed to lead to an associate degree or certificate in a specific career field;

(3) include the development of tech-prep education program curricula appropriate to the needs of the consortium participants;

(4) include in-service training for teachers that—

a) is designed to train teachers to effectively implement tech-prep education curricula;

b) provides for joint training for teachers from all participants in the consortium; and

c) may provide such training in weekend, evening, and summer sessions, institutes or workshops;

(5) include training programs for counselors designed to enable counselors to more effectively

a) recruit students for tech-prep education programs;

b) ensure that such students successfully complete such programs; and

c) ensure that such students are placed in appropriate employment;

(6) provide equal access to the full range of technical preparation programs to individuals who are members of special populations, including the development of tech-prep education program services appropriate to the needs of such individuals; and

(7) provide for preparatory services which assist all participants in such programs.

(c) ADDITIONAL AUTHORIZED ACTIVITIES.—Each such program may—

(1) provide for the acquisition of tech-prep education program equipment; and

(2) as part of the program's planning activities, acquire technical assistance from State or local entries that have successfully designed, established and operated tech-prep programs.

SEC. 345. APPLICATIONS.

(a) IN GENERAL—Each consortium that desires to receive a grant under this part shall submit an application to the Secretary or the State board, as appropriate, at such time and in such manner as the Secretary or the State board, as appropriate, shall prescribe.

(b) THREE-YEAR PLAN.—Each application submitted under this section shall contain a 3-year plan for the development and implementation of activities under this part.

(c) APPROVAL—The Secretary or the State board, as appropriate, shall approve applications based on their potential to create an effective tech-prep education program as provided for in section 344.

(d) SPECIAL CONSIDERATION.—The Secretary or the State board, as appropriate, shall give special consideration to applications which—

(1) provide for effective employment placement activities or transfer of students to 4-year baccalaureate degree programs;

(2) are developed in consultation with business, industry, and labor unions; and

(3) address effectively the issues of dropout prevention and re-entry and the needs of minority youths, youths of limited English proficiency, youths with handicaps, and disadvantaged youths.

(e) EQUITABLE DISTRIBUTION OF ASSISTANCE—In making grants under this part, the Secretary shall ensure an equitable distribution of assistance among States and the Secretary or the State board, as appropriate, shall ensure an equitable distribution of assistance between urban and rural consortium participants.

(f) NOTICE—

(1) In the case of grants to be made by the Secretary, each consortium that submits an application under this section shall provide notice of such submission and a copy of such application to the State educational agency and the State agency for higher education of the State in which the consortium is located.

(2) The Secretary shall notify the State educational agency, the State agency for higher education, and the State council on vocational education of any State each time a consortium located in such State is selected to receive a grant under this part.

SEC. 346. REPORTS.

(a) REPORT TO THE SECRETARY. - In the case of grants made by the Secretary, each grant recipient shall, with respect to assistance received under this part, submit to the Secretary such reports as may be required by the Secretary to ensure that such grant recipient is complying with the requirements of this part.

(b) REPORT TO THE CONGRESS.—After grant recipients who receive grants in the first year in which grants are made under this part complete their eligibility under the program, the Secretary shall submit to the Congress a report evaluating the effectiveness of the program under this part.

SEC. 347. DEFINITIONS. For purposes of this part:

(1) The term 'articulation agreement' means a commitment to a program designed to provide students with a nonduplicative sequence of progressive achievement leading to competencies in a tech-prep education program.

(2) The term 'community college'—

(A) has the meaning provided in section 1201 (a) of the Higher Education Act of 1965 for an institution which provides not less than a 2-year program which is acceptable full credit toward a bachelor's degree; and

(B) includes tribally controlled community colleges.

(3) The term 'tech-prep education program' means a combined secondary and postsecondary program which—

(A) leads to an associate degree or 2-year certificate;

(B) provides technical preparation in at least 1 field of engineering technology, applied science, mechanical, industrial, or practical art or trade, or agriculture, health, or business;

(C) builds student competence in mathematics, science, and communications (including through applied academics) through a sequential course of study; and

(D) leads to placement in employment.

(4) The terms 'institution of higher education' and 'higher education' include institutions offering apprenticeship programs of at least 2 years beyond the completion of secondary school.

APPENDIX F

CRITERIA FOR EXCELLENCE IN ASSOCIATE OF APPLIED SCIENCE (AAS) DEGREE PROGRAMS

Criteria for Excellence in AAS Degree Programs as adopted by the American Associate of Community and Junior Colleges are:

A. Associate degree programs designed primarily for immediate employment should be designated as an Associate in Applied Science Degree Program.

B. The AAS degree should be identified with a specialty designation.

C. AAS degree programs must be responsive to the employment needs of business industry, public agencies, the military, and entrepreneurship.

D. All components of the AAS degree requirements should become outcome oriented.

E. The AAS degree requirements should be limited to 60 to 72 semester credit hours or 90 to 108 quarter credit hours.

F. The technical specialty component of the AAS degree should constitute 50% to 75% of the course credits.

G. The general education component of AAS degree programs should constitute a minimum of 25% of the course credits with the combination of general education and related studies constituting up to 50% of the course credits.

H. Although open admission to the institution for all adults is a cardinal characteristic of most community, technical, and junior colleges, minimum criteria for admission to AAS degree programs are essential.

I. AAS degree programs should be supported by student services designed systematically for the needs of career-oriented students.

J. A curriculum structure with multiple exit/re-entry points should be considered for the AAS degree whenever possible.

K. Credit toward the AAS degree should be awarded for knowledge and skills acquired through prior experiences.

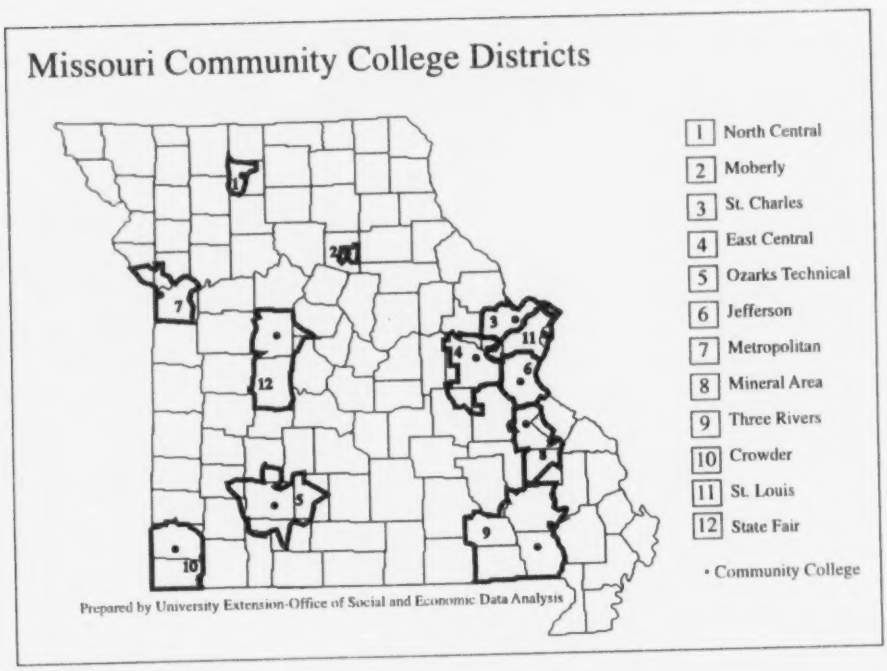
L. AAS degree curricula should be articulated with appropriate general and vocational secondary schools.

M. AAS degree curricula should be articulated with receptive and appropriate four-year institutions through the cooperative planning and implementation of transfer agreements including two + two curricula.

N. Selected AAS degree programs should be networked among two-year institutions at the local, state, and national levels.

APPENDIX G

MISSOURI COMMUNITY COLLEGE SERVICE REGIONS


Missouri Community College Districts
1 North Central
2 Moberly
3 St. Charles
4 East Central
5 Ozarks Technical
6 Jefferson
7 Metropolitan
8 Mineral Area
9 Three Rivers
10 Crowder
11 St. Louis
12 State Fair
• Community College
Prepared by University Extension-Office of Social and Economic Data Analysis

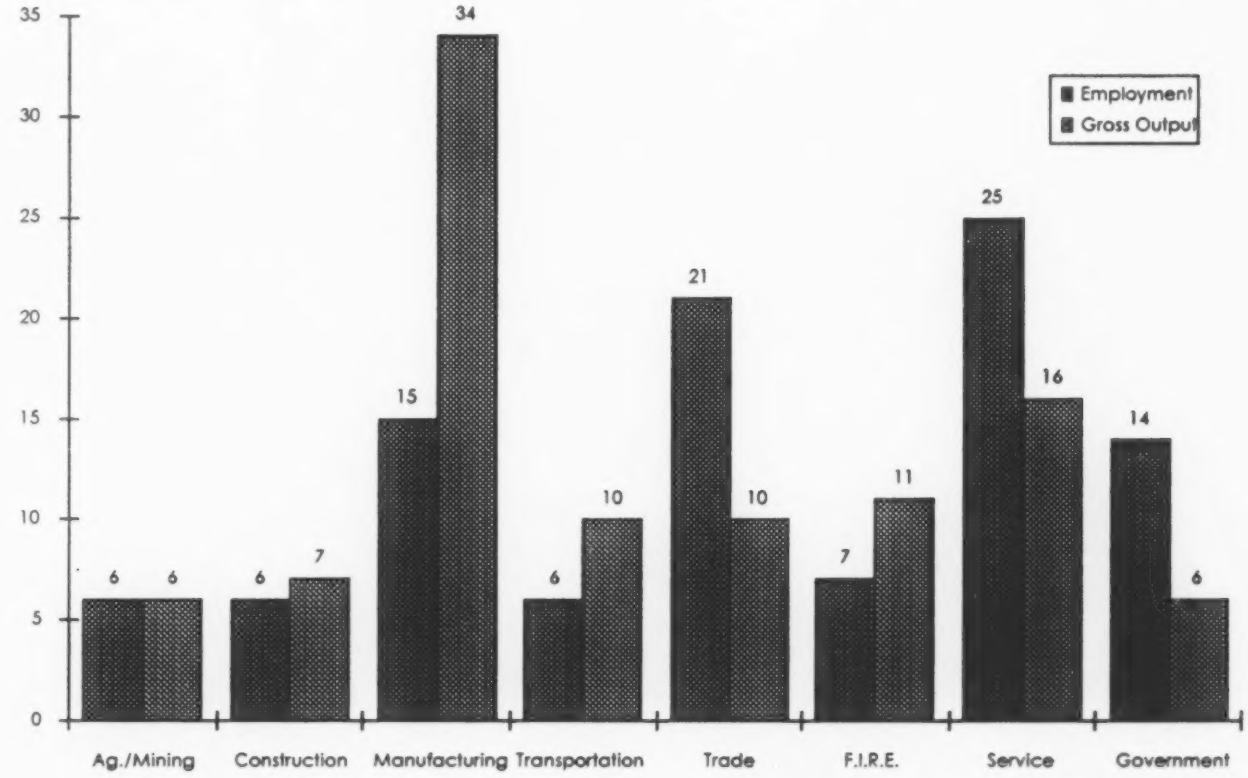
Missouri Community College Service Regions *
Community College
North Central
Moberly
Metropolitan
St. Charles
St. Louis
State Fair
East Central
Jefferson
Mineral Area
Crowder
Mineral Area
Three Rivers
Ozark Technical
* for out of District Delivery of Vocational-Technical Education

APPENDIX H

POSTSECONDARY DEGREE PROGRAM INVENTORY

MISSOURI PUBLIC COMMUNITY COLLEGES

Missouri Employment and Gross Output by Sector, 1990



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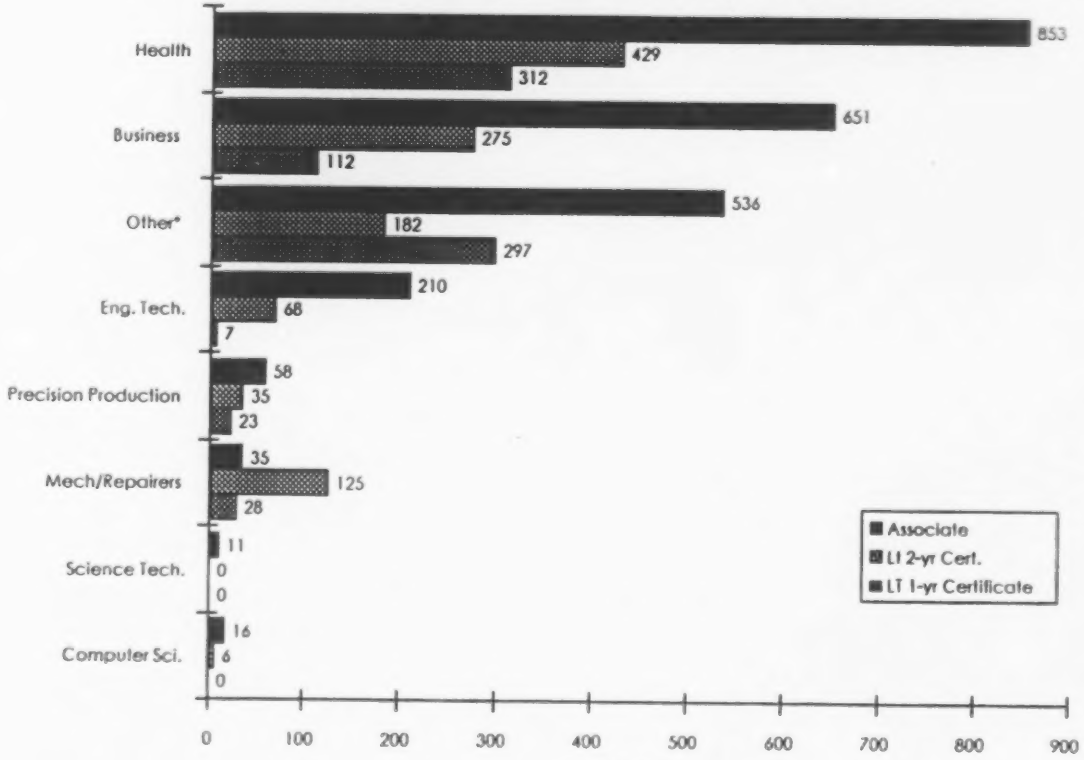
Certificates and Associate Degrees Conferred in Occupationally-Specific Programs, Public Two-year Institutions, FY 1994



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CAREER PROGRAMS

Associate of Applied Science degrees of one and two year certificates may be earned in various vocational career programs at Missouri's junior colleges:

	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
AGRICULTURE																
Agribusiness	•									•					•	•
Ag Equip	•															
Ag Production	•															
Farm Power Tech	•															
Farm & Ranch Mgmt	•									•						
Hort		•												•		
Poultry Sci	•															
Veterinary				•		•										
ALLIED HEALTH																
Allied Health Tech			•	•						•						
Cardiology Tech																
Chemical Ind Stud												•		•		
Dental Assist		•	•					•					•			•
Dental Hygiene													•			
Dietetic Tech												•				
Emerg Med Tech	•	•		•		•	•	•	•		•	•	•			•

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	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
Gerontology													•			
Health Care Admin								•								
Health Information Tech			•				•									
Intravenous Therapy			•													
Med Lab Tech							•	•								•
Medical Office Asst															•	
Medical Records Tech							•				•					
Medical Secr	•	•	•	•	•	•	•	•	•							
Medical Transcription													•			
Medications Tech			•	•				•								
Nursing (assc degree)	•	•		•			•	•	•	•	•	•	•	•	•	•
Nursing aide	•		•	•				•								•
Nursing (LPN)			•	•			•	•	•	•	•				•	•
Occup Therapy Asst			•				•							•		
Paramedic Tech							•							•		•
Physical Therapy Tech							•							•		
Radiologic Tech							•						•			
Respiratory Therapy			•								•		•		•	
Surgical Tech			•				•						•			
Ultra Sound Tech													•			

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	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
BUSINESS																
Accounting	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•
Accounting Clerk		•											•			
Admin Office Systems														•		
Advertising	•											•		•		
Banking & Finance			•								•	•	•	•	•	•
Business Admin	•	•	•		•		•				•	•	•	•		
Business Mgmt	•	•		•	•	•	•	•	•	•	•	•			•	•
Merchandising	•				•				•						•	
Clerical	•		•	•		•	•	•	•		•	•	•		•	
Computer Eng Tech												•				
Computer Info	•	•				•	•		•		•	•	•	•	•	
Computer Net & App							•									
Commerical Art							•				•		•	•		
Court/Conf Reporting														•	•	
Credit Management												•				
Data Entry			•								•					•
Data Processing			•		•	•	•	•		•						•
Enterpren Mgt							•					•	•			
Fashion Merchandising								•				•				
Food Service Mgmt			•				•							•		

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	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
General Business	•				•	•	•	•			•					
Hotel/Motel Mgmt				•			•									
Interior Design														•		
Industrial Supv/Main															•	
Intern Business													•			
Labor Mgt Relations												•	•			
Legal Asst/Aide												•		•		
Legal Office Systems														•		
Legal Secretary	•	•	•	•	•	•		•	•	•					•	
Mgmt & Super Dev												•	•			
Manufact Tech													•			•
Marketing	•			•	•				•		•					•
Mass Comm													•			
Material Mgmt									•					•		
Mid Mgmt	•					•	•	•	•	•					•	
Office Automation		•									•					•
Office Mgmt	•		•		•	•	•		•		•	•		•	•	•
Office Systems & Tech			•	•	•		•				•	•	•	•		
Para-legal Tech							•									
Real Estate												•		•		
Retailing					•		•									

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	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
Sales												•		•		•
Secretarial Sci	•	•			•	•	•	•	•	•	•	•	•		•	•
Small Business Mgmt																•
Supervision						•	•				•	•	•		•	
Voice Data Anal														•		
Word Processing				•	•	•	•				•	•	•	•	•	
SCIENTIFIC/TECH																
Architectural Tech				•							•		•	•		
Auto Manuf Sys																•
Aviation (Flight tech)						•							•	•		
Aviation Mainten						•										
Avionics						•										
Biomed Engr Tech													•			
Broadcast Engr												•	•			
Chemical Tech							•					•				
Civil Tech								•				•	•			
CADD				•							•	•	•			
Computer Aided Mfg											•	•	•			
Computer Aided Publish											•		•			
Computer Info Systems		•							•		•	•	•			•
Computer Ops & Prog				•	•				•		•	•	•			

	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
Computer Tech			•	•	•	•	•			•	•	•			•	
Drafting & Design	•	•		•	•			•			•	•				•
Electricity/Electronics	•	•		•	•	•		•	•		•	•	•		•	
Electronics Engr Tech				•	•						•	•	•			
Elec Stu/Gra Dsgn App												•				
Eng Drafting (Civil)												•				
Eng Drafting (Mech)											•	•	•			
Graphic Comm												•				
Industrial Tech	•		•					•	•							•
Industrial Elec Tech						•			•		•	•	•	•		
Mass Comm													•			
MicroComp/ Networking			•	•			•	•			•	•				
Micro Processors											•	•	•			
Phlebotomy	•												•			
Robotics/Technology				•							•	•	•			
Technical/Business												•	•	•		
Technical Illustration												•	•	•		
Telecommunications				•							•	•	•			
MECHANICAL/ REPAIR																
A/C/Refrig/Heat		•	•	•			•									

	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
Automotive Tech	•		•	•	•								•		•	
Autobody Repair	•		•													
Construction Tech	•		•					•		•		•	•			•
Diesel Tech	•				•											
Electro Mechanical Tech													•			
Industrial Tech	•							•	•				•			
Lead Maintenance Mech													•			
Machine Tool Tech	•			•	•	•									•	•
Maintenance Mechanic													•			
Mech Engr Tech							•					•	•			
Metal Technology									•							
Plumbing Design													•			
Power Plant Tech						•										
Truck Driving	•															
Waste Water Treatment	•										•					
Welding	•	•	•	•					•						•	
OTHER																
Adv Design & Comm Art											•		•			
Admin of Justice					•	•	•				•					
Applied Technology										•						

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	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
Art												•				
Bldg Materials Merch		•			•										•	
Bldg Inspection					•								•			
Bldg Insp/Code Enf Tech													•			
Child Care & Dev				•			•	•	•		•	•	•	•		
Child Care Asst												•				
Commer/Indus Photo													•			
Commercial Photog													•			
Comp Dsgn/Comm Art							•									
Consumer Homemaking												•				
Corporate Security													•			
Corrections					•		•				•					
Creative Writing												•				
Criminal Justice		•				•	•	•		•	•	•	•	•		•
Culinary Arts						•	•						•			
Deaf Communication												•				
Early Childhood Ed				•			•				•					
Film												•				
Fire Sci		•	•	•								•	•			
Foreign Lang												•				

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	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
Funeral Director													•			
Funeral Serv ed													•			
Graphic Comm													•			
Home Econ							•									
Hospitality		•	•	•									•			
Human Services					•						•	•	•	•		
Interpreter Ed												•				
Journalism												•				
Law Enforcement				•							•	•	•			
Literature												•				
Mortuary Sci													•			
Multimedia					•							•				
Parks & Rec Mgmt	•															
Photo Comm													•			
Photo Lab Tech													•			•
Political Sci											•					•
Postal Mgmt					•			•								
Pre-Chiroprtic Stds														•		
Printing/Graphics Tech			•								•	•				
Public Safety Officer						•					•					
Qual Contrl/Res Tech					•							•	•			

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	Crowder	E. Central	OTC	Jefferson	Longview	Maple Woods	Penn Valley	Mineral Area	Moberly	North Central	St. Charles	Flo Valley	Forest Park	Meramec	State Fair	Three Rivers
Restaurant Cook	•															
Seasonal Ranger Training																•
Sign Lang Interpret							•									
Tourism						•							•			

Courtesy of Missouri Community Colleges Association

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APPENDIX I

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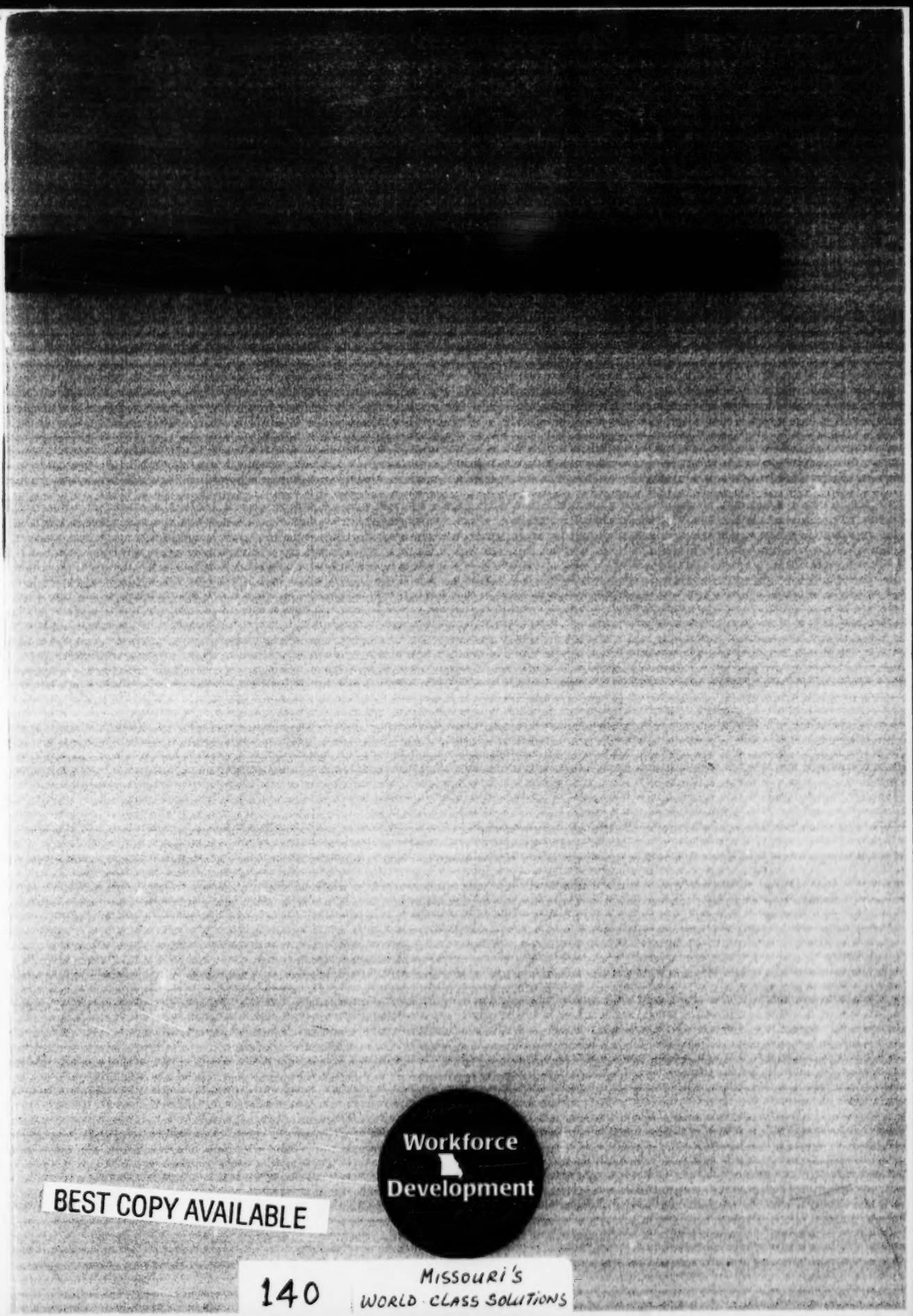

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